Investigating mechanisms of Behavioural Activation for Depression

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Main Project

Investigating mechanisms of Behavioural Activation for Depression

Supervised by Dr Katherine Rimes and Dr Thorsten Barnhofer

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Abstract

Background: The efficacy of behavioural activation (BA) treatments for depression has been demonstrated in various clinical trials (e.g. Dimidjian et al., 2006). Although a single session of BA intervention has shown significant changes in symptoms of depression in a college student population (Gawrysiak et al., 2009), this has not been evaluated with a clinical population. Despite a clear behavioural rationale and research evidence underlying BA treatments, questions regarding mechanisms of change remain unanswered. From a BA perspective, a key aim is to reduce depressive avoidance behaviours and increase healthy non-avoidance behaviours (Trew, 2011).

Method: This study investigated the impact of one treatment session of Brief Behavioural Activation Treatment for Depression (Lejuez et al., 2001) on depressive symptomatology, self-reported avoidance and behavioural approach and avoidance tendencies measured using the Approach Avoidance Task (AAT; Rinck & Becker, 2007). A sample of 40 depressed participants from primary care psychological therapies services were randomised to either treatment or control group. Self-reports of symptoms and cognitive factors were assessed before (Time 1) and after the one-week intervention phase (Time 2), and at one-month follow-up (Time 3). Approach and avoidance behavioural tendencies were assessed at Times 1 and 2 using the AAT.

Results: There was a significant decrease in depressive symptoms between Time 1 and Time 2 for the treatment group but not the control group. Performance on the AAT showed the expected pattern, with increases in approach to positive valence stimuli (happy faces), although effects failed to reach significance. Meditational analyses indicated small indirect effects of self reported change in activation and avoidance as mediators of the effect of condition on depressive symptoms.

Discussion: This is the first study to demonstrate the efficacy of one session of BA for depression using a clinical sample. There was preliminary support for the hypothesis that reduced avoidance may mediate treatment effect. The theoretical and clinical implications of the study findings are discussed. Further replication of this study is needed, with changes in avoidance measured prior to changes in symptom outcomes to help establish a causal relationship.

Overview of study

As one of the most prevalent mental health disorders, depression has attracted a large body of research, with different treatments in vogue at varying points during the last several decades. Treatment dominance has fluctuated between behavioural treatments (1970s), to cognitive therapies (1980s), moving onto contemporary behavioural treatments and third wave treatments most recently. There has been a burgeoning interest in Behavioural Activation over the last decade. Efficacy of this treatment has been demonstrated in several research studies, leading to its inclusion in national guidelines for depression. Despite recent proliferation of studies on behavioural activation, research has not progressed to understanding what drives change in this treatment. What is the active ingredient in Behavioural Activation? This remains an important yet unanswered question.

This thesis identified that a possible mechanism of change could be changes in approach and avoidance behaviours. Depression is characterised by reduction in activities leading to low self-esteem and self-confidence and hopelessness. Key to Behavioural Activation treatment is addressing behavioural avoidance as this helps maintain low mood. The treatment encourages individuals to engage in healthy behaviours, promoting a sense of achievement and pleasure, to help break the cycle of depressive symptoms.

Avoidance in relation to depression has not been heavily researched, and studies exploring possible mechanisms of change in Behavioural Activation are fewer still. This study begins with Chapter 1, which reviews the relevant literature, mapping the course of behavioural treatments of depression, and research findings in relation to approach and avoidance behaviours in depression. Chapter 2 outlines the design and measures utilised in the current study. Chapter 3 describes the findings whilst Chapter 4 outlines these findings in relation to the current literature, with a discussion of possible theoretical and clinical implications.

2. Introduction

2.1 Depression

2.1.1. Epidemiology of Depression

Depression was once described as “the common cold of psychiatry” by Seligman (1975), to reflect the high prevalence of this disorder. The World Health Organisation (WHO) has estimated that depression affects around 121 million people worldwide and is one of the leading causes of disability. Prevalence of depression in the population is high, with the latest Adult Psychiatric Morbidity study estimating that around 17% of the UK population experience depression and/or anxiety at any given time (McManus et al., 2009). Consequently the combined economical cost of depression and anxiety is high in the UK. Layard et al. (2006) estimates that it costs £17 billion a year, equivalent to 1.5% of the UK’s total national income.

Depression is often a chronic relapsing condition, with relapses expected to occur in 50–80% of individuals who have previously experienced an episode of clinical depression (Judd, 1977). Gender differences have been found within depression, with higher prevalence rates among women (e.g. Nolen-Hoeksema, 1987, Angst & Merikangas, 1997). Depression has been associated with low socio-economic status (e.g. Dohrenwend, Levav, Shout & Schwartz, 1992; Lorant et al., 2003). Extending the idea of this association further, Weich et al. (2002) found that areas of greater social incivilities e.g. graffiti, litter, vandalism and gangs, were associated with higher levels of depression.

Studies have frequently found a strong pattern of diagnostic co-morbidity between depression and other mental health disorders (Kessler, Nelson, McGonagle & Lui, 1996). It has been argued that depression not complicated by another mental health disorder is the exception rather than the norm (Hirschfield, 2001). One of the highest reported co-morbidities has been with anxiety disorders, Kessler et al. (1996) found that 50% of patients meeting criteria for major depression also met criteria for a concurrent anxiety disorder. Higher anxiety co-morbidity figures have been reported within primary care settings, with 75% of patients diagnosed with depression within a primary care environment meeting criteria for an anxiety disorder (Olfson et al., 1997). Co-morbidity with other psychiatric disorders has also been found, e.g. substance

misuse (Miller, Klamen, Hoffmann & Flaherty, 1996; Mezzich, Ahn, Fabrega & Pilkonis, 1990) and eating disorders (Braun, Sunday & Halmi, 1994).

2.1.2. Diagnosis of Depression

There are two main schedules which are used to diagnosis psychiatric conditions such as depression; International Classification of Mental and Behavioural Disorders (ICD-10; World Health Organisation, 1992) and Diagnostic and Statistical Manuals of Mental Disorders (DSM-V; American Psychiatric Association, 2013). A high degree of comparability exists between the two diagnostic systems (see Table 1), with only one symptom difference (reduced self-esteem and self-confidence in the ICD-10).

Table 1. Comparison of DSM-V and ICD-10 criteria for depression.

	DSM-V	ICD-10
Core symptoms	Depressed mood Loss of interest or pleasure	Depressed mood Loss of interest or pleasure Reduced energy/activity
Additional symptoms	Reduced energy Appetite or weight change Disturbed sleep Psychomotor agitation/retardation Feelings of worthlessness/guilt Reduced concentration or indecision Suicidal ideation	Appetite or weight decrease Disturbed sleep Psychomotor agitation/retardation Feelings of unworthiness/guilt Reduced concentration or attention Suicidal ideation Reduced self esteem and self confidence
Duration for diagnosis	2 weeks	2 weeks
Distress/impairment	Symptoms must cause distress/impair one important area of functioning	Not specified

A formal diagnosis of depression using the ICD-10 classification system requires four out of ten depressive symptoms. In contrast the DSM-IV system requires four out of nine symptoms for a diagnosis of ‘Major Depression’. Both diagnostic schedules stipulate that individuals should have been experiencing symptoms for at least 2 weeks.

2.2. Clinical Presentation of Depression

Depression is characterised by many symptoms affecting all areas of the individual’s life (see Table 1). Symptoms can be broadly conceptualised into 4

domains: physical, behavioural, cognitive and affective. Physical symptoms include diminished appetite and disturbed sleep. Behavioural symptoms include reduced engagement in activities and withdrawal from social situations. Cognitive symptoms include reduced concentration, attention, self-esteem and self-confidence. Affective symptoms such as ideas of guilt and hopelessness about the future and themselves are also present in the individual.

2.2.1. Approach-Avoidance behaviours in depression

As the clinical presentation of depression includes reduced engagement in activities, several models of depression have focused on the role of approach deficits and increased avoidance (e.g. Ferster, 1973; Hopko, Lejuez, Ruggiero & Eifert, 2003; Jacobson, Martell & Dimidjian, 2001). Such changes likely to be influenced by a range of different factors, including the physical, affective and motivational features mentioned above.

2.2.2. Role of Approach deficits in depression

Approach deficits have been linked to symptoms of depression, with Fowles (1988) suggesting an association between hopelessness, anhedonia, loss of energy and loss of appetite when rewards have been reduced or are no longer present.

Approach deficits are associated with depression in a number of different manners. Research has shown links between depression and reduced appetitive motivation (e.g. Eastman, 1976). Other approach deficits have been highlighted in relation to personal goals. Depressed individuals are less likely to generate approach goals. Approach goals that are developed are likely to be less specific, attainable and adaptive (Dickson & MacLeod, 2004a, 2004b). Reduced generation of approach goals, or indeed appropriate approach goals, could lead to the development of a depressive cycle with diminishing expectations of achieving a pleasurable outcome, leading to decreased generation of approach goals which contributes to maintenance of depressive symptoms. This cycle prevents the individual from experiencing the very activities that could actually function as a reinforcer for increasing approach goals. Dickson and MacLeod (2004a) argued that the approach goal deficits displayed by depressed individuals within their study maybe a reflection of

hopelessness. They suggested that hopelessness would inhibit the development of approach goals, as this would be viewed as a futile exercise when failure has been predicted as the most likely outcome. Over time, increased exposure to approach deficits may aid facilitation of heightened rumination e.g. “What’s the point of even trying when my plans never work”, “I didn’t manage to do it last time, why bother trying again?” locking the individual into a cycle of rumination and maintaining depression.

Whilst the idea of an approach deficit model has been suggested in relation to depression, other researchers have argued for an approach perseveration model (e.g. Pyszczynski & Greenberg, 1987a, 1987b). The Self-Regulatory Perseveration Theory (Pyszczynski & Greenberg, 1987a, 1987b) posits that individuals can have difficulty separating from goals important to their sense of self, despite being unattainable or loss of the expected outcome. Perseveration of this goal can lead to failure, increasing negative affect or increasing awareness of personal shortcomings. Over time this can manifest as a depressive attributional style, leading to the development of depression. On the surface, these two models conflict each other, however closer examination by Trew (2011) has led to the suggestion that the two models are not mutually exclusive. Approach perseveration may lead to reduced expectations, which may then contribute to approach deficits. Furthermore, Pyszczynski and Greenberg’s (1987a, 1987b) model does not imply an absence of approach goals and behaviours.

2.2.3. Role of Avoidance in depression

Within the context of depression, two key broad domains of avoidance – (behavioural and cognitive) have emerged (Ottenbriet & Dobson, 2004). Behavioural avoidance refers to the behavioural ways in which an individual may seek to escape or refrain from participating in an event, action or person e.g. staying at home rather than going to meet a friend for lunch. In contrast, cognitive avoidance refers to the cognitive measures an individual may utilise as a way of attempting to avoid thinking of a particular situation, problem, emotion or person e.g. using distraction to avoid thinking of relationship difficulties. Research findings have supported the association between behavioural and cognitive avoidance with depression, even after controlling for

rumination and anxiety as possible confounders (Moulds, Kandris, Starr & Wong, 2007; Williams & Moulds, 2007).

Avoidance is associated with reduced exposure to positive experiences (Pyszcynski & Greenbery, 1987), with less opportunity of positive reinforcement for adaptive behaviours (Hopko, Lejuez, Ruggiero & Eifert, 2003). Depressed individuals are likely to engage in less rewarding activities or events due to the clinical presentation of depression. They are more likely to predict situations as being difficult or anxiety provoking and avoid these situations. However, avoidance of such situations prevents the individual from accessing potential sources of positive reinforcement, thus maintaining depression and reducing the likelihood of experiencing a positive event. Dickson and MacLeod (2006) have found that depression is associated to avoidant goals and plans, with dysphoric adolescents describing more avoidance goals than approach goals.

The coping literature has also contributed to increasing understanding of the role of avoidance and depression. Using a coping strategies framework, Grant et al. (2013) explored the relationship between avoidance coping strategies and symptoms of anxiety and depression. Their results showed that there was a significant reciprocal relationship between behavioural avoidance coping and depressive symptoms. Other longitudinal studies have suggested that avoidance coping directly adds to the development and maintenance of depressive symptoms (Cronkite, Moos, Twohey, Cohen & Swindle, 1998; Holahan & Moos, 1986; Holahan, Moos, Holahan, Brennan & Schutte, 2005).

Some researchers (e.g. Martell, Addis & Jacobson, 2001; Carvalho & Hopko, 2011) have argued that rumination, an important internal process in the maintenance of depression (e.g. Nolen-Hoeksema, 2000) should also be viewed as a form of avoidance. Rumination refers to a pattern of behaviour whereby an individual repetitively engages in thinking about the symptoms of their distress (e.g. “Why can’t I be bothered to do anything”) and meanings and consequences of their distress (e.g. “I’m a bad person”) (Nolen-Hoeksema, Larson & Grayson, 1999). Martell et al. (2001) have suggested that engaging in rumination, although often intended to help the person make sense of their situation, may inadvertently prevent the individual from being able to effectively

problem solve, restricting engagement in healthy behaviours and reinforcing symptoms of depression.

2.2.4. Models of approach and avoidance

Within the literature there are several theoretical models of approach and avoidance, linking these constructs to affect and emotion (Gray, 1987a, 1990; Carver & Scheier, 1990; Higgins, 1987, 1997). The most prominent of these is Gray's (1987, 1990) model of three motivational systems (Behavioural Inhibition System, BIS; Behavioural Activation System, BAS; Fight, Flight, Freeze System, FFFS), coined Reinforcement Sensitivity Theory (RST). From a depression perspective, only two of systems are of primary concern; BIS and BAS.

Research has shown that different brain structures are associated with each motivational system (Gray 1986, 1987b, 1990). The BAS has been linked to areas of cortical and sub-cortical structures within the cerebral cortex, thalamus and striatum. In contrast, the BIS has been linked to brain areas including the medial and lateral septal areas, hippocampus and dentate gyrus (Gray, 1986a, 1987, 1990). When presented with appetitive stimuli, it has been hypothesised that the BAS becomes activated, leading to increased approach behaviours (Depue & Zald, 1993). In contrast, the BIS has been hypothesised as becoming activated when presented with aversive stimuli or conditioned signals of punishment, leading to increased avoidant responses (Gray, 1971, 1982). The two systems are thought to regulate two types of experiences. The BIS has been suggested as regulating punishment and aversive experiences, whilst the BAS has been associated with reward and appetitive experiences. Consequently different feelings are associated with the two systems. Feelings of elation, hope and desire have been linked to BAS (Depue & Zald, 1993); in contrast feelings of anxiety and arousal have been connected to BIS. These two motivational systems have been theorised to explain a number of different psychiatric disorders, including anxiety (Gray, 1982), attention deficit hyperactivity disorder (Barkley, 1997) and conduct disorder (Quay, 1993).

Extending Gray's (1987, 1990) work further, Depue and Iacono (1989) proposed an association between depression and deficits in the BAS system.

They argued that individuals with depression are likely to have lower BAS functioning, with research studies supporting this suggestion (e.g. Henriques & Davidson, 2000; Kasch, Rottenberg, Arnow & Gotlib, 2002). For example, Henriques and Davidson (2000) used a laboratory setting to explore the behavioural responses of depressed and non-depressed individuals. Participants were asked to recall previously presented words, linked to either monetary reward or punishment. Changes that occurred as a function of reward were conceptualised as an analogue of BAS functioning whilst behavioural changes occurring as a function of punishment were viewed as an analogue of BIS functioning. In line with Depue and Iacono's (1989) suggestion of reduced BAS functioning in depression, depressed participants did not modify their pattern of response to the reward condition.

Carver and Scheier's (1990) model of approach and avoidance, known as cybernetic control theory, places greater emphasis on self-regulation and feedback loops, linking these constructs with affect. This theory postulates that approach and avoidance behaviours are embodied within discrepancy-reducing and enlarging feedback loops, in relation to reference values (e.g. goals) (Carver, 2006). Discrepancy-reducing feedback loops essentially represent approach processes whereby an individual would endeavour to reduce the perceived discrepancy between their current state and desired state. For example, if an individual wished to achieve the goal of being a car owner they would engage in processes such as looking in car magazines, to take them from their current state from being a non-car owner to the desired state of owning a brand new car. In contrast, discrepancy-enlarging feedback loops are viewed as avoidance processes, as these loops seek to create distance from the reference value, thought of as 'anti-goals', representing values which the individual does not wish to embody. In psychological terms, an example of an anti—goal is a feared or disliked possible self (Markus & Nurius, 1986; Ogilvie, 1987), others include public embarrassment or being terminated by your employer. For example, an adolescent wishing to be different from a sibling will assess his/her own behaviour, then compare this to their perception of their siblings behaviour and seek to create as much as discrepancy as possible between the two. Affect is linked to these feedback loops, with affect conveying information about progress towards the desired state as well as modifying

behavioural output (Carver, Avivi & Laurenceau, 2008; Carver & Scheier, 2008). Essentially it is proposed that exceeding a set of criterion (e.g. goal expectations) will result in positive feelings leading to increased effort whilst performing below a set of criterion will lead to the experience of negative affect with reduced or withdrawing effort.

More recently, Trew (2011), drawing on existing literature, has proposed a conceptual model of approach and avoidance processes in relation to depression (see Figure 1).

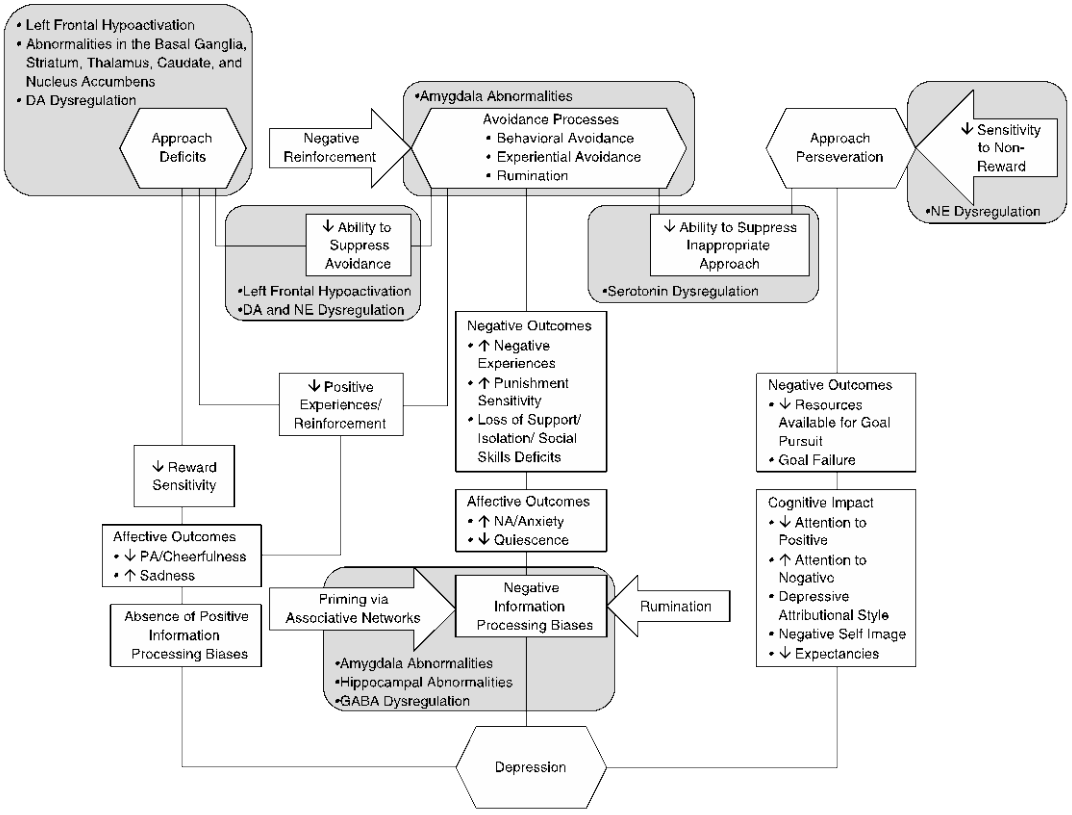


Figure 1. Trew's (2011) integrative model of approach and avoidance processes in relation to depression.

Within this comprehensive integrative model, Trew has utilised previous research and suggested several different ways in which avoidance relates to depression. The model emphasises the importance of three key processes; (i) deficits in approach behaviours, (ii) the role of avoidance behaviours, (iii) approach perseveration and factors linking these processes to depression. By

using an integrative method Trew has included both cognitive processes and biological components.

In this model, Trew argues that (i) decreased approach and increased avoidance contributes to the development and maintenance of depression by reducing potential access to sources of positive reinforcement, (ii) avoidance contributes to several negative information processing biases observed in depression (e.g. Gomez & Gomez (2002) found that BAS activation led to retrieval of pleasant emotional memories whilst BIS activation led to retrieval of unpleasant emotional memories), and lastly (iii) avoidance processes and dysregulated approach and avoidance system connections lead to approach perseveration, whereby an individual continues to follow unachievable goals leading to maintenance of depression.

2.3 Behavioural treatment approaches to Depression

With high prevalence rates and economical costs, depression has attracted a large body of research. Many theorists have used different psychological approaches to describe the onset and maintenance of depression. Treatment approaches have been developed from these proposed models and theories. Given the focus of this study on the role of approach- and avoidance-related processes, this review of the literature will focus predominately on the contribution of behavioural theories and treatment approaches (see Appendix A for a brief overview of national guidelines for depression and a summary of other recommended treatments).

2.3.1 Early Behavioural approaches of depression

There are three key concepts which can be found in all behavioural models of depression: behaviour, environment and contingent relationships between behaviour and environment. Contingent relationships are akin to ‘if-then’ relationships whereby a behaviour will lead to an environmental consequence. Central to behavioural theories is the development of behaviour-environment relationships over time.

Models by Ferster (1973) and Lewinsohn (1974) have been highly influential in the early behavioural literature relating to depression. In essence, their

behavioural models have suggested that the development and maintenance of depression occurs as a consequence of a vicious cycle of decreased environmental reward and associated reductions in instrumental behaviour and response-contingent positive reinforcement.

Ferster's (1973, 1981) work was based on Skinner's (1957) radical behaviourism principles with an emphasis on functional analysis of behaviour. Two behavioural patterns were highlighted as being central to the development of depression: (1) low number of positively reinforced social behaviours and (2) increasing number of escape or avoidance behaviours. According to Ferster, depression occurs in a learning context whereby the individual either does not receive positive environmental reward for a behaviour or when escape from an aversive behaviour is reinforced. Over time behaviours, which would have resulted in positive consequences, cease to do so. For example, an individual may stop attempting to form close relationships if this behaviour is not positively reinforced by others, e.g. other people do not respond to their attempts at conversation.

With reduced response-contingent positive reinforcement (RCPR)[1] occurring, Ferster suggested that there are three consequences, which help facilitate the development of depression. The initial consequence of the above learning context involves an individual no longer attending to potential sources of positive reinforcement within their environment as they have already learned that their efforts are not successful. Secondly, an individual's repertoire of adaptive behaviours diminishes as the number of positively reinforced behaviours reduces, with a more passive role adopted as they learn that their attempts have not produced positive consequences. Lastly, Ferster suggested that increasing frequency of aversive consequences to behaviours leads to individuals becoming more preoccupied with escape and avoidance behaviours, with more effort expended on these latter behaviours rather than seeking possible positive reinforcement.

[1] RCPR refers to a behaviour resulting in a positive or pleasurable outcome.

Following on from Ferster, Lewinsohn (1974) added another element to the early behavioural work on depression. Like Ferster, Lewinsohn and colleagues (Lewinsohn, 1974; Lewinsohn, Youngren, & Grosscup, 1979; Lewinsohn, Hoberman, Teri, & Hautzinger, 1985) highlighted the importance of RCPR in the development of depression (see Figure 2).

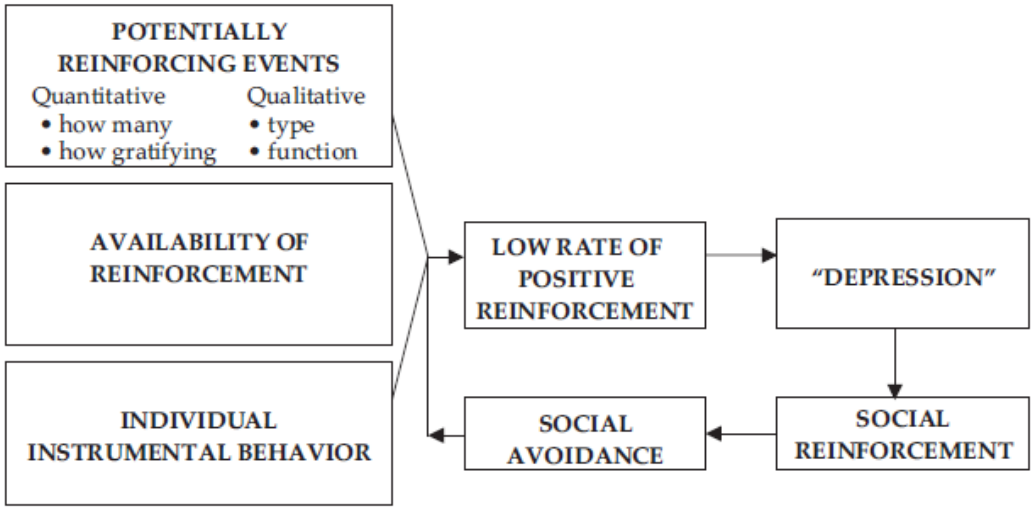


Figure 2. Lewinsohn's behavioural model of depression (Lewinsohn, 1974) taken from Dimidjian, Barrera Jr, Martell, Munoz and Lewinsohn (2011).

Lewinsohn et al. (1974, 1979, 1985) postulated that depression would occur when a stressor or environmental factor, e.g. bereavement, marital breakup, disrupted typical behaviour patterns, leads to reduced RCPR. Three factors were suggested as impacting on the rate of RCPR: (i) number of potentially reinforcing behaviours for the individual, which could vary depending on several different factors, e.g. age or gender, (ii) availability and frequency of reinforcing behaviours within the environment, e.g. would the reinforcement occur on a sufficiently frequent basis to shape and maintain the non-depressive behaviour, and (iii) instrumental behaviour required from the individual to receive the reinforcement and whether this behaviour exists within the individual's repertoire to then receive positive reinforcement from others. The addition of a negative feedback loop of social reinforcement highlights the role of family members or friends reinforcing depressive behaviours. Social reinforcement

and reduced RCPR then lead to a decrease in pleasant events and an increase in aversive events, both associated with the onset of depression.

2.3.2. Contemporary Behavioural treatment models of depression

In recent years interest has returned to behavioural approaches in the treatment of depression. Two groups of researchers have been central in the development of contemporary behavioural models of depression, based on behavioural activation: Martell, Addis and Jacobson (2001) and Lejuez, Hopko, LePage, Hopko and McNeil (2001).

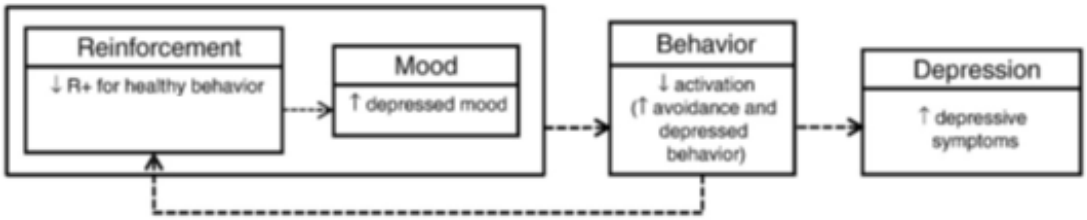


Figure 3. Contemporary behavioural model of depression (Manos, Kanter & Busch, 2010).

The psychopathology model shown in Figure 3 has provided the foundation of both Martell et al.'s (2001) and Lejuez et al.'s (2001) work and gone on to inform Behavioural Activation (BA) and Brief Behavioural Activation Treatment for Depression (BATD) interventions, respectively. Both models are based on early behavioural approaches to depression (e.g. Ferster, 1973 and Lewinsohn, 1974). Traditional behavioural principles have been extended to enable the models to: (i) become more idiographic in nature, with greater emphasis placed on the environment, (ii) help better understand functional aspects of behaviour, (iii) utilise a balanced acceptance-change paradigm. The differences between the models occur within the reinforcement box. Whilst decreased positive reinforcement is a key component of both models, each model has a different emphasis. Key to both models is the idea of targeting behavioural avoidance, as this contributes to the maintenance of depressive symptoms.

Within the BA model proposed by Martell et al. (2001), the trigger of a depressive episode is located within the individual's life, with an event acting as the causal critical event e.g. breakdown of relationship. Reduced RCPR opportunities lead to depressed mood as increasing negative reinforcement occurs. Avoidance behaviours are utilised as a way of managing low rates of RCPR opportunities. Increasing avoidance patterns narrow an individual's repertoire of behaviours, creating secondary problems which help maintain depression, e.g. withdrawing from social situations (avoidance behaviour) leading to reduced invitations to social events (secondary problem) and limiting opportunities of RCPR. Related to avoidance patterns are routine disruptions, which Martell et al. suggested maintain depression as individuals feel out of sync with their environment.

The BATD model proposed by Lejuez et al. (2001) extended the work of Lewinsohn to include matching theory (Herrnstein, 1970; McDowell, 1982) to understand depression. Matching theory was originally proposed by Herrnstein (1970) as a mathematical account of behaviour and applied to non-human behaviours. McDowell (1982) extended this to human behaviours. Based on a concurrent reinforcement schedule, matching theory posits the ratio of behaviour as being equal to the ratio of received reinforcement. When applied to depression, matching theory suggests that the time and effort related to engaging with depressed/healthy behaviour is proportionate to the relative value of the reinforcement received for these behaviours. Using the psychopathology model in Figure 3, Lejuez et al proposed that as changes in reinforcement contingencies occur (more specifically as positive reinforcement decreases), the number of depressive behaviours increase leading to subsequent depressed mood. The focus on increasing healthy behaviours is positioned within a values-driven framework, borrowed from Acceptance and Commitment therapy (ACT; Hayes, Strosahl & Wilson, 1999) so that healthy behaviours align with an individual's values and beliefs.

2.4. Behavioural treatments for depression

2.4.1. Early Behavioural treatments of depression

Behavioural treatments for depression were developed based on the reinforcement explanation of depression, which is evident in both Ferster (1973)

and Lewinsohn (1974) work. Essentially this explanation suggests that depression occurs when there is a reduction or lack of response contingent positive reinforcement behaviours. This decreasing reinforcement leads to fewer behaviours being rewarded. Behaviours subsequently reduce in frequency, intensity and quality (Lewinsohn et al., 1974; 1979; 1985). The results of several studies provided support for this proposed explanation. A significant relationship was found between mood and engagement with pleasant activities (Lewinsohn & Graf, 1973; Lewinsohn & Libet, 1972), later leading to the development of the Pleasant Events Schedule (PES; McPhillamy & Lewinsohn, 1972). Other studies showed that when individuals are depressed they find fewer activities pleasant, engaging in pleasant activities less often and receiving less positive reinforcement (McPhillamy & Lewinsohn, 1974).

Following on from this, Lewinsohn, Biglan and Zeiss (1976) developed one of the seminal treatments for depression from a behavioural perspective. They consolidated previous research into a treatment whereby individuals monitored their mood and engagement with daily activities in order to understand the association between these. Intervention involved increasing frequency of pleasant activities and interactions with the environment and decreasing frequency and subjective experience of unpleasant activities, with a focus on social skills and interactions with other people. Several studies demonstrated the efficacy of this activation-based approach to depression (Barrera, 1979; McNamara & Horan, 1986; Zeiss, Lewinsohn & Munoz, 1979).

As interest in cognitive therapies increased over the latter part of the twentieth century, there was a move away from purely behavioural approaches in the treatment of depression. However activation-based elements of treatment remained within interventions of depression. Two key examples of this were Coping with Depression (CWD; Lewinsohn, Antonuccio, Steinmetz & Teri, 1984) and Cognitive therapy of depression as developed by Beck, Rush, Shaw and Emery (1979) (see Appendix A for further information). Both of these were multi-component treatments with a primarily cognitive focus but included behavioural techniques such as activity scheduling, graded task assignment and self-monitoring.

2.4.2. Contemporary behavioural treatments of depression

With the integration of behavioural techniques into treatments of depression, there was a changing zeitgeist that pure behavioural approaches were inadequate in the treatment of depression. Cognitive therapies enjoyed a long tenure as the treatment of choice for depression, however interest in behavioural treatments was revitalised following two key studies by Jacobson et al. (1996) and Dimidjian, et al. (2006).

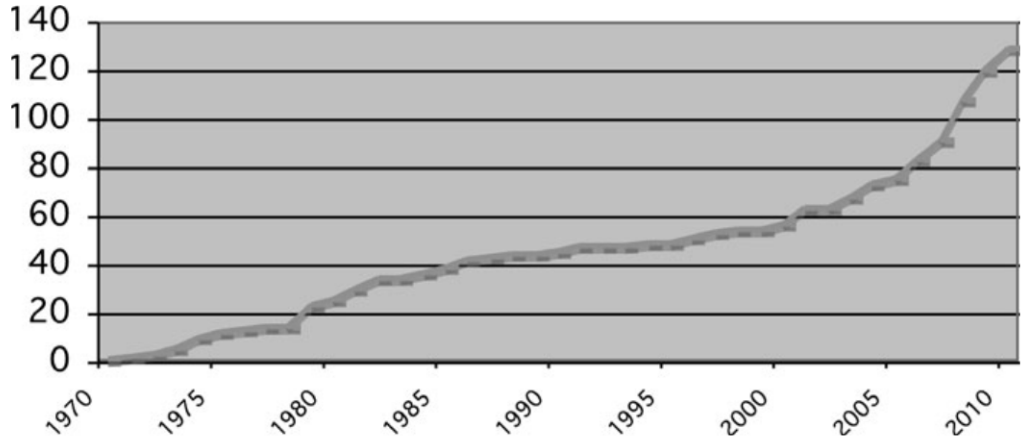


Figure 4. Cumulative number of behavioural activation related publications. (Dimidjian et al., 2011).

Figure 4 highlights the revived interest in behavioural activation, showing the number of publications related to behavioural activation published over the last four decades. Since the late 1990's research has been increasing both in frequency and breadth of interest, with more recent studies exploring the application of behavioural activation to populations with medical and psychiatric co-morbidity, use of different mediums in the delivery of treatment and development of culturally diverse versions of behavioural activation treatment.

Key to this renewed interest was work by Jacobson et al. (1996), who were interested in dismantling cognitive behavioural therapy (CBT) treatment for depression in order to compare the relative efficacy of each treatment component. 150 participants meeting DSM-III-R (American Psychiatric Association, 1987) diagnostic criteria for Major Depressive Disorder were randomised to (i) Behavioural Activation, (ii) Behavioural Activation with

modification of dysfunctional thoughts or (iii) the full CBT package. Participants received a maximum of 20 treatment sessions. The results showed that the behavioural component of CBT, called Behavioural Activation was comparable in its effect to the full version of CBT, with no significant differences between the treatments at 6 month follow up. These results suggested that behavioural treatments alone could be as effective as the full package of CBT in the treatment of depression. Furthermore, the results started to raise interesting questions about the necessity of cognitive components in treatments of depression.

More recently, Dimidjian et al. (2006) undertook a comprehensive randomised controlled study comparing Behavioural Activation, Cognitive therapy (CT), anti-depressant medication (ADM; Paroxetine) and placebo treatments. Dimidjian et al. utilised an expanded version of the Behavioural Activation treatment described in Jacobson et al.'s (1996) study. The results of Dimidjian et al.'s study showed that Behavioural Activation was comparable to ADM and more efficacious than CT, for participants with severe depression. Participants in the BA condition were found to stay in treatment for longer, with lower attrition rates in relation to ADM, with higher rates of participants in remission. There were no treatment differences amongst participants with less severe depression. The results of this study added to the growing number of questions about use of cognitive components and directly targeting cognitions to achieve a treatment response for depression. Dimidjian et al. highlighted the value of behavioural strategies, e.g. goal setting, activity scheduling and graded task assignment in bringing about change in depression symptomatology. Furthermore, the results of this study indicated that the use of an expanded model of behavioural activation was more advantageous than simply utilising behavioural strategies as in Jacobson et al.'s (1996) study.

Both Jacobson et al. (1996) and Dimidjian et al. (2006) highlighted the value of stand alone behavioural treatments, instead of behavioural treatments being integrated into CBT. Following on from these studies, contemporary behavioural treatments started to emerge. Two parallel treatments have arisen: BATD (Lejuez, LePage, Hopko & McNeil, 2001) and BA (Martell, Addis & Jacobson, 2001). Both treatments are rooted in traditional behavioural models and

treatments of depression, but have extended these ideas leading to two treatments with differing components. Both research groups have contributed heavily to recent literature relating to behavioural activation. This research study has focused on the BATD model rather than the BA model, however a brief description of BA is provided below for greater depth and understanding.

2.4.2.1. Behavioural Activation (BA)

Martell et al. (2001) developed BA treatment, focusing on the functional facets of depressive behaviour. One of the key components of BA involves understanding the environmental triggers and ineffective coping responses utilised by an individual, which help to maintain depression. Martell et al. highlighted the importance of behavioural avoidance, and how depressed behaviours become coping strategies in order to avoid environmental situations. This leads to low levels of positive reinforcement being provided for the individual leading to depressed mood.

BA treatment involves the identification of recurrent avoidance patterns using the TRAP (trigger, response, avoidance pattern) method. TRAP involves increasing an individual's awareness of *triggers*, which lead to negative emotional *responses*. In turn, these contribute to the development of *avoidance patterns*, which over time become the individuals' default way of coping. The main focus of treatment lies in helping the individual to develop alternative and more healthy ways of coping as well as re-engaging in these behaviours (TRAC; trigger, response and alternative coping). Another core part of the BA treatment involves enabling individuals to learn to recognise the functions of behaviours. By understanding the functional aspect of behaviour, individuals can learn about the relationship between different types of behaviours (avoidance, escape or continued engagement) and impact on mood, forming a key part of relapse prevention.

2.4.2.2 Brief Behavioural Activation Treatment for Depression (BATD)

Whilst Martell et al. (2001) were developing the BA treatment model, another group of researchers, Lejuez et al. (2001), developed the BATD treatment protocol using matching theory (Herrnstein, 1970; McDowell, 1982) as its primary framework. BATD suggests that increasing reinforcement relating to

healthy behaviours leads to subsequent decreased reinforcement of depressive behaviours. Change in reinforcement is sought through environmental change. By targeting reinforcement of healthy behaviours, frequency of depressive behaviours should reduce, with decreasing depressive symptomatology. In line with this view, Lejuez et al. have labelled behaviours as being either healthy or depressive within their treatment protocol.

BATD treatment aims to create an environment of increasing frequency and reinforcement of healthy behaviours e.g. by asking other family or friends to notice and respond positively to healthy behaviours, whilst simultaneously reducing reinforcement of depressed behaviours. Underpinning BATD is the ACT principle of value-driven behaviour, with healthy behaviours developed to fit an individual's values and beliefs. Using this framework, goals are identified from major life areas e.g. education, employment, social life, family life or hobbies. For example, the goal may be to spend time daily playing with their child to fit the value of wanting to be a good parent.

Once a range of goals has been ascertained, these are positioned within an activity hierarchy, in terms of level of difficulty. This is a key aspect of BATD as patients are expected to progressively work through this activity hierarchy using a structured activity scheduling approach. Individual goals are set out as activity schedules, specifying frequencies and durations, to gradually build up towards the level of activity specified in the long-term goal.

2.4.2.3. Differences between BA and BATD intervention

Whilst BA and BATD have both extended the work of traditional behavioural theories and therapies (Ferster, 1973; Lewinsohn, 1974), some differences exist between the two interventions in terms of strategies and processes of change. BA utilises a functional behavioural analytical approach to understand avoidance patterns whereas BATD does not specifically focus on this. BA includes a number of additional components, which are not present within BATD, e.g. mental rehearsal and mindfulness training. Differences also exist in treatment components common to both BA and BATD. This can be most easily highlighted using the example of activities in graded tasks/goals. Within BA this task has an open structure whereby the therapist has greater flexibility in

suggestion of activities, assessment of life goals and deciding whether additional treatment strategies are required. In contrast, within BATD this is completed using a more structured approach using the ACT principle of value-driven behaviours. Once the activity hierarchy has been developed, individuals are required to take more of a primary role involving goal selection and maintaining behavioural check out sheets (to monitor completion of activities).

2.4.2.3. Evidence for contemporary behavioural activation for depression treatments

In a meta-analysis of 34 studies Mazzucchelli, Kane & Rees (2009) concluded that behavioural activation treatments were as effective as cognitive therapy, with effects equivalent to cognitive therapy and CBT lasting until 24 months. Mazzucchelli et al. (2009) noted that all variants of behavioural activation treatment produced similar effects, with differences between variants of behavioural activation not statistically significant. Mazzucchelli et al.'s (2009) results echo the results of previous meta analyses (Cuijpers, van Straten & Warmerdam, 2007; Ekers, Richards & Gilbody, 2008), which found behavioural activation treatments equivalent to the current recommended treatments for depression.

Behavioural activation has been found to have lower rates of attrition during treatment (Daughters, Braun, Sargeant, Reynolds, Hopko et al., 2008), with less attrition than CBT (Cuijpers, van Straten, Andersson & van Oppen, 2008), reduced likelihood of relapse or reoccurrence of depression in comparison to medication (Dobson, Hollon, Dimidjian, Schmaling, Kohlenberg et al., 2008) and superior performance to CBT in the treatment of cognitive therapy non-responders (Coffman, Martell, Dimidjian, Gallop & Hollon, 2007). Behavioural activation has been successfully extended across the lifespan, with studies showing reduced depressive symptoms post treatment for older adults (Meeks, Looney, Van Haitsma, Teri, 2006; Teri, Logsdon, Uomoto & McCurry, 1997). At the other side of the lifespan, research has started to explore the use of behavioural activation with adolescents (McCauley, Schloredt, Gudmundsen & Martell, 2011) with promising results although this remains an emerging research area.

Research evidence for BATD largely comes from case studies and small-randomised controlled trials, which have shown favourable results. In their meta-analysis Mazzucchelli et al. (2009) have therefore suggested that BATD would benefit from high quality randomised controlled trials, as would other versions of behavioural activation treatment.

Hopko, Lejuez, LePage, Hopko and McNeil (2003) compared BATD to treatment as usual (non-directive therapy) at an inpatient psychiatric hospital. Their results showed greater changes for depressive symptomatology, measured by the Beck Depression Scale (BDI; Beck & Steer, 1987) for the BATD group. Gawrysiak, Nicholas and Hopko (2009) looked at the efficacy of one session of BATD. Participants (university students with moderate symptoms of depression) received a single 90-minute session of BATD which was followed by a two week treatment interval. The results showed significant reductions of depressive symptoms in comparison to the non-treatment group.

BATD has been successfully applied to other clinical populations where there is co-morbidity with depression, highlighting the wide generalizability of this treatment protocol. Applications to other disorders include; co-morbid depression and substance use (Daughters et al., 2008), co-morbid anxiety and depression (Hopko, Lejuez & Hopko, 2004) and depressed cancer patients (Hopko, Bell, Armento, Hunt & Lejuez, 2005). Kanter et al., (2010) have noted that BATD has been primarily used in settings where financial or time efficiency is required.

The use of BATD in the present study was driven by the reduced complexity of this treatment protocol in comparison to BA, thus lending itself more easily to investigating the mechanisms of change. Whilst BATD is more structured and uses fewer additional strategies beyond those directly related to activation, BA utilises additional secondary strategies and techniques e.g. mental rehearsal, likely increasing the likelihood of confounding factors. This would present greater difficulties in disentangling the effect of individual component parts. In contrast, BATD provides a less complex and more structured framework within which to investigate possible mechanisms of change.

2.5. Mechanisms of change in behavioural activation treatments of depression

As outlined above, behavioural treatments for depression have developed over the course of several decades, with initial treatments in the 1970's (e.g. Lewinsohn, 1974) to more recent treatments (e.g. Martell et al., 2001; Lejuez et al., 2001). Research has predominately focused on demonstrating the efficacy of these behavioural treatments (e.g. Cuijpers, van Straten & Warmerdam, 2007; Mazzucchelli, Kane & Rees, 2009), with results indicating positive outcomes. However, despite a clear rationale there is little understanding of the processes implicated in behavioural activation treatments. Research has not yet investigated possible mediators or mechanisms of action of behavioural activation treatment.

Mediators refer to the psychological processes which may be responsible for therapeutic gains that has occurred. Kazdin (2007) described a mediator as the intervening variable between the independent and dependent variables relationship. The study of mediators within treatments provides a wealth of information. Mediational analysis helps test the proposed theoretical mechanisms underlying change in a treatment. Understanding and identifying mediators are a key aspect of the evaluation of treatments as this can help with improvement of therapeutic techniques (e.g. equipping clinicians with the knowledge about which techniques may result in the most change) and maximise treatment effectiveness. Furthermore, knowing about mediating changes is important as results can potentially guide decision making between different therapies.

2.5.1. Approach, avoidance behaviours and BATD

Understanding the mechanisms of change of behavioural activation has been suggested as the next step by several researchers (e.g. Dimidjian et al., 2006; Martell, Addis & Dimidjian, 2004). As approach and avoidance behaviours have been explicitly targeted as a focus of treatment, Martell et al. (2004) proposed that this could be a possible active ingredient of behavioural activation treatments. Whilst avoidance has been highlighted in earlier theories relating to depression, e.g. Ferster (1973) who proposed that avoidance has a key role in maintaining depression, this has been overlooked in subsequent research. With

the development of newer variants of behavioural activation treatments such as BA and BATD, there has been a greater emphasis on reducing avoidance behaviours. The advent of such interventions provides an opportunity to explore the role of approach avoidance behaviours, and whether these changes can affect the treatment of depression. It is conceivable that changes in approach and avoidance behaviours during the course of behavioural activation treatment may mediate changes in depressive symptomatology, leading to decreased depressive symptoms at post treatment.

2.5.2. Measuring approach-avoidance behavioural tendencies

Within the literature, attempts have been made at measuring activation during the course of treatment. Activation can be viewed as a measure of approach behaviours, as behavioural activation treatments aim to increase approach whilst reducing avoidance. Several questionnaire measures of approach/avoidance have been developed, specifically in relation to behavioural activation, whilst experimental measures of approach/avoidance behavioural tendencies also exist.

2.5.2.1. Questionnaire measures of approach avoidance

As research has highlighted the multidimensional nature of avoidance (experiential, behavioural and cognitive; e.g. Cribbs et al., 2006) measures should aim to capture some information about each of these different types of avoidance. Potentially this may help to guide future research pathways, as some types of avoidance may have stronger associations with behavioural activation treatments. Ottenbriet and Dobson (2004) have developed a measure to reflect this multifaceted nature of avoidance – Cognitive Behavioural Avoidance Scale (CBAS). It should be noted that whilst CBAS measures avoidance, it was not specifically designed for treatment studies.

Rumination has been conceptualised by behavioural researchers as another type of avoidance (Goldiamond & Oyrud, 1968; Martell et al., 2010). One of the most widely used measures within the literature remains the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991). Recently, research studies have attempted to dismantle the construct of rumination (e.g. Treynor, Gonzalez & Nolen-Hoeksema, 2003) to identify the maladaptive aspect of

rumination. In a factor analytic study of the RRS, Treynor et al. (2003) identified two factors, labelled reflection and brooding, with differential effects on depression. The brooding factor, Treynor et al. found was associated with greater depression both concurrently and longitudinally. In comparison, the reflection factor was associated with greater concurrent depression but less depression longitudinally. Moulds, Kandris, Starr and Wong (2007) explored the relationship between avoidance, depression and rumination using the CBAS and RRS. Their results showed that avoidance was able to predict unique variances in depression scores over and above anxiety and depression. The brooding RRS subscale was correlated with the Behavioural Social subscale of the CBAS, after anxiety was partialled out, whilst reflection was not correlated with any avoidance measures. This adds to Treynor et al.'s (2003) suggestion that the brooding subscale links most closely to depression, indicating that this maybe the most toxic and maladaptive aspect of rumination, contributing to the maintenance of depression.

Despite renewed interest in behavioural activation treatments this has not translated into development of specific outcome measures. As a way of addressing this issue, Kanter, Mulick, Busch, Berlin and Martell (2007) developed the Behavioural Activation for Depression Scale (BADS), to help explore the process of change in behavioural activation treatments. The BADS measures activation (reflecting level of goal directed activation), avoidance/rumination (measuring avoidance of aversive thoughts and feelings), work/school impairment and social impairment. It was designed for use weekly during treatment and is sensitive enough to capture weekly changes in behaviour (Manos, Kanter & Busch, 2010).

2.5.2.2. Experimental measures of approach avoidance

Experimental measures can provide useful information, as questionnaire measures can be prone to demand characteristics and social desirability, affecting responses on a measure. Experimental measures often use reaction time tasks, with responses thought to indicate more automatic processes. The advantages of using experimental measures over self-report measures have been noted by Krieglmeyer and Deutsch (2010) as being; (i) a valid measure of behavioural reaction, (ii) measuring behavioural reactions beyond the

individuals' awareness, which even if they wished to report, they may not be able to do so, (iii) more ethically viable and less challenging in comparison to any natural study of approach or avoidance behavioural tendency.

One paradigm that has been used in experimental measures incorporates use of facial expressions. Previous research studies have illustrated that different facial expressions are associated with approach and avoidance. Davidson (1992) found that a joyful face was likely to elicit a similar, congruent expression in the observer, increasing the likelihood of approach behaviour. In contrast, others have found that negative emotions are avoidance oriented, with expressions of anger more likely to elicit avoidance from an observer (Marsh, Ambady & Kleck, 2005).

Building on such findings, Rinck and Becker (2007) recently developed an approach/avoidance task (AAT) that measures implicit approach and avoidance tendencies. Utilising previous research findings, the AAT, a joystick reaction time task, is based on the premise that positive stimuli will elicit approach behaviours (pull on the joystick) and negative stimuli will elicit avoidance behaviour (push away on the joystick) (Cacioppo, Priester & Berntson, 1993; Chen & Bargh, 1999). The AAT consists of individuals being presented with a series of stimuli e.g. faces with different facial expressions, which they are asked to respond to using a joystick attached to the screen. A zooming function is employed whereby pulling the joystick towards you will result in the picture on the screen increasing in size until it fills the entire screen. Pushing the joystick will lead to the picture decreasing in size until it has significantly shrunk in size. This zooming effect creates a visual impression of a picture coming close towards you when pulling the joystick or a picture moving away from you as the joystick is pushed.

Studies have highlighted the usefulness of using this experimental framework for investigating behavioural approach and avoidance tendencies. The AAT research paradigm has previously been used to investigate approach and avoidance behaviours in the study of anxiety (e.g. Heuer, Rinck & Becker, 2007; Lange, Keijsers, Rinck & Becker, 2008; Lange, Salemink, Windey, Keijsers, Krans, Becker et al, 2010; Roelofs, Putman, Schouten, Lange, Volman & Rinck,

2010), spider phobia (e.g. Klein, Becker & Rinck, 2007; Rinck & Becker, 2007) and addictions (Wiers, Rinck, Kordts, Houben & Strack, 2010). When exploring approach and avoidance in samples of socially anxious individuals (Heuer, Rinck & Becker, 2007; Lange, Keijsers, Rinck & Becker, 2008), results have indicated that highly socially anxious individuals display stronger avoidant behavioural tendencies to smiling and angry faces in comparison to control participants.

Vrijsen, van Oostrom, Speckers, Becker and Rinck (2012) have extended the AAT paradigm further by incorporating the use of emotional faces. In their study participants were induced to either happy or sad mood using film clips, behavioural approach and avoidance tendencies were then explored using the AAT. The AAT consisted of ten pictures of individuals displaying sad, angry, neutral or happy facial expressions, as well as ten control pictures (chessboard pattern). All pictures received a blue or purple colour filter, resulting in 100 stimuli pictures. The task was completed on a computer with an attached joystick. Pictures were presented to individuals after the mood induction task. They were asked to push pictures with a blue filter and pull pictures with a purple filter. Results showed that behavioural approach avoidance tendencies were related to depressive characteristics, with happy faces avoided the most by participants with the highest depressive symptomatology. These results suggest that the use of AAT would help to provide information about approach and avoidance tendencies in depression.

2.6. Aims of the current study

Within the literature, behavioural activation treatments have been demonstrated as being effective in the treatment of depression (e.g. Dimidjian et al., 2006; Hopko et al., 2003). As efficacy has been shown, the next logical direction of research lies in understanding the processes implicated in changes in depressive symptomatology, following treatment. There has been little research investigating the mechanisms of change within behavioural activation treatments. Research has illustrated that a relationship between depression and approach avoidance does exist (e.g. Aldao, Nolen-Hoeksema & Schweiser, 2010; Grant, Wingate, Rasmussen, Davidson, Slish et al., 2013). This study aims to extend this idea further by exploring whether changes in approach and

avoidance behavioural tendencies occur following a single treatment session of BATD. Use of a single session of BATD will build on research by Gawrysiak et al. (2009), who demonstrated significant effects in a sample of students experiencing moderate symptoms of depression. Their results indicate that such minimal intervention may have sufficient impact on individuals to allow investigation of the mechanisms of action of BATD, although this has yet to be replicated using a clinical sample.

Bearing in mind this gap within the literature regarding approach avoidance behavioural tendencies and mechanisms of change within behavioural treatments of depression, the present study set out to investigate (a) the impact of one session of BATD for a clinical sample of depressed participants from a primary care psychology service, (b) changes in participant's tendencies towards approach and avoidance as tested using an experimental task and self-report questionnaires following one session of BATD, and (c) whether these approach / avoidance changes mediate symptom change.

2.6.1 Hypotheses of the current study

Based on review of the relevant literature it is hypothesized that;

(i) In comparison to control participants, participants in the treatment condition will show greater changes in depressive symptomatology,

(ii) Compared to control participants, patients in the treatment condition will show significant increases in approach towards positive emotional faces and reductions in avoidance of negative emotional faces, and greater improvements in avoidance and rumination on self-report questionnaires

(iii) That the degree of these approach / avoidance changes will mediate the impact of treatment condition on changes in depressive symptoms.

3. Methods

3.1. Design

A two group comparison design was utilised for this study, with assessment measures completed before treatment (Time 1), after treatment (Time 2) and at one month follow up (Time 3). Participants were recruited from primary care psychological therapies services in Southwark and Lambeth. Participants were randomised to either treatment or waiting list control at Time 1. Participants in the treatment condition received one session of a modified form of BATD. Participants in the waiting list control condition did not receive treatment until their participation in the study ended.

The two primary dependent variables were PHQ-9 (Kroenke, Spitzer & Williams, 2001) scores and reaction time scores on the Approach Avoidance Task (AAT; Rinck & Becker, 2012) at Time 2. Secondary dependent variables were scores on the other self-report measures; Behavioural Activation and Depression Scale (BADS; Kanter, Mulick, Busch, Berlin, & Martell 2006), Acceptance and Action Questionnaire (AAQ; Hayes, Strosahl, Wilson, Bissett, Pistorello, et al., 2004), Ruminative Response Scale (RRS; Nolen-Hoeksema and Morrow, 1991), Cognitive Behavioural Activation Scale (CBAS; Ottenbreit & Dobson 2004).

3.2. Participants

3.2.1. Recruitment

Participants for the study were recruited from primary care psychological therapy services in the London boroughs of Lambeth (Lambeth Psychological Therapies Service; LPTS) and Southwark (Southwark Psychological Therapies Service; SPTS). As part of the initial assessment for these services, patients are asked for consent for researchers to contact them. Only participants who had consented to being contacted for research were invited to participate in the study.

Allocated workers in SPTS and LPTS created spread sheets with details of patients using the following filters on their computer system; consented to research contact, scored above 10 on the PHQ-9 and had a diagnosis of

depression recorded. These lists were generated on a three weekly basis and forwarded to the researcher using password-protected emails.

3.2.2. Inclusion and exclusion criteria

Participants were only included in the study if they had a current primary diagnosis of major depression, aged between 18 and 60, able to speak fluent English and scored above 10 on the PHQ-9. Patients over 60 were excluded due to differences in clinical presentation for depression e.g. greater expression of somatic complaints (Blazer, Hughes & George, 1987).

A number of exclusion criterion were utilised in this study, which are outlined below;

- History of psychosis or mania
- Self-harmed in the last four weeks
- Current diagnosis of eating disorder or OCD
- Current drug/ alcohol/ medication abuse or dependence
- History of traumatic brain injury or epileptic seizures
- High risk for suicide in the absence of any on-going support
- Unable to refrain from taking benzodiazepines 48 hours before completing the experimental tasks. This was a necessary criterion because of research evidence suggesting that taking benzodiazepines can decrease recognition of facial expressions (e.g. Blair & Curran, 1999), possibly impacting on participant's responses on the experimental task in this study.
- Psychotherapy/counselling at a frequency of more than once a month

Participants currently taking antidepressants were included in the study, with the caveat that medication had not been changed during the four weeks before starting the study.

3.2.3. Sample Size

A preliminary power analysis was conducted (using statistical software G*Power 3.0.10,) to establish the necessary sample size. The power analysis calculation was based on the results achieved by Gawrysiak et al. (2009). An a priori t-test power analysis indicated that 10 participants would be needed in each of the

two groups to have 95% power for detecting a large sized effect (as found by Gawrysiak et al., 2009 which is the closest existing study to the one proposed here) when employing the .05 criterion of statistical significance.

3.3. Outcome Measures

Several different outcome measures were used at different stages in the study which are described in detail below.

3.3.1. Clinical interview

The Mood module of the Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Williams & Gibbons, 1995) was used to confirm that participants met diagnostic criteria for Major Depressive Disorder. The SCID is a semi-structured interview measuring lifetime and current Axis I disorders, as defined by the Diagnostic Statistical Manual – 4th edition (DSM-IV; American Psychological Association, 2000). The Mood module takes around 10-15 minutes to administer.

3.3.2. Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer & Williams, 2001)

The PHQ-9 (see Appendix B) is based on the diagnostic criteria for Major Depressive Disorder in the DSM IV. Designed for primary care settings, this self-administered questionnaire consists of items derived from the DSM-IV classification system and pertaining to; anhedonia, depressed mood, trouble sleeping, feeling tired, change in appetite, guilt or worthlessness, trouble concentrating, feeling slowed down or restless and suicidal thoughts.

It consists of nine items, which are used to measure depression symptomatology over the last two weeks. Items are answered using a 4-point Likert scale, from 0 (‘Not at all’) to 3 (‘Nearly every day’). Scores range from 0 to 27. The PHQ-9 has cut-off points of 5, 10, 15 and 20, which represent symptoms of mild, moderate, moderately-severe and severe depression respectively.

The PHQ-9 has been validated with several different clinical populations, including primary care populations (e.g. Kroenke, Spitzer & Williams, 2001).

Kroenke et al (2001) found that the majority of their sample with no depressive disorder (93%) had a PHQ-9 score below 10. In contrast, most participants meeting criteria for a depressive disorder (88%) scored above 10 on the PHQ-9. In line with this, the guidelines for Improving Access to Psychological Therapies (IAPT) services, like the services used for recruitment in this study, suggest that individuals scoring 10 or above can be considered as experiencing clinically significant symptoms of depression (National IAPT Programme Team, 2011).

The PHQ-9 has been shown to have good sensitivity to change over time (Löwe, Kroenke, Herzog, & Gräfe 2004). A score of above 10 has been found to have 88% sensitivity and 88% specificity for major depression (Kroenke, et al. 2001). Kroenke et al. (2001) found high internal consistency using two different populations (Cronbach's α= 0.86 and 0.89). The scale showed good internal consistency in the current study at Time 1 (Cronbach's α= 0.77), Time 2 (Cronbach's α= 0.89) and Time 3 (Cronbach's α= 0.81).

3.3.3. Behavioural Activation and Depression Scale (BADS; Kanter, Mulick, Busch, Berlin, & Martell, 2006)

The BADS (see Appendix C) was developed to measure when and how individuals become less avoidant and more activated over the course of treatment. A self-administered questionnaire, it consists of 25-items, producing a total scale score and 4 subscale scores. The subscales are: "Activation", representing focused, goal-directed activation and completion of scheduled activities e.g. "I engaged in a wide and diverse range of activities"; "Avoidance/Rumination" representing avoidance of negative aversive states and engaging in rumination rather than active problem solving e.g. "I did things to avoid feeling sadness or other painful emotions"; "Work/School Impairment", representing inactivity and passivity regarding work and school responsibilities e.g. "I stayed in bed for too long even though I had things to do"; and "Social Impairment" representing similar social consequences and social isolation e.g. "I did not see any of my friends". Items are answered using a 6-point Likert scale ranging from 0 ('Not at all') to 6 ('Completely'). Higher scores represent increased behavioural activation.

The BADS was originally validated using an undergraduate college sample (Kanter et al., 2006). This study demonstrated good internal consistency (α = 0.79) and test–retest reliability (r = 0.74). Further validation by Kanter, Rusch, Busch and Sedivy (2008) has been undertaken using a community sample of individuals experiencing elevated levels of depressive symptoms. They demonstrated that the BADS had good psychometric properties with good construct validity with measures of avoidance (CBAS) and depression (Center for Epidemiological Studies – Depression Scale, Radloff, 1977). Kanter et al. (2008) found the BADS total scale had good internal consistency (Total scale α= 0.92, Activation α= 0.84). The total scale scores in the current study showed good internal consistency at Time 1 (Total scale α= 0.84), Time 2 (Total scale α= 0.89) and Time 3 (Total scale α= 0.92).

3.3.4. Acceptance and Action Questionnaire (AAQ; Hayes, Strosahl, Wilson, Bissett, Pistorello, Toarmino, et al., 2003)

The AAQ (see Appendix D) was designed to measure experiential avoidance and psychological flexibility. It was originally developed by Acceptance Commitment Therapy (ACT) therapists, who generated items based on the clinical processes targeted by ACT. The items relate to key aspects of the experiential avoidance construct and link experiential avoidance to inaction, the literalness of thoughts, controlling private events in the same manner as real-world events, and escape or avoidance of negatively evaluated content. Example items include “When I feel depressed or anxious I am unable to take care of my responsibilities; It’s ok to feel depressed or anxious; When I compare myself to other people its seems that most of them are handling their lives better than I do”.

Whilst the AAQ was originally developed to measure experiential avoidance and psychological flexibility, Hayes, Luoma, Bond, Masuda and Lillis (2006) have suggested that the AAQ is in fact a broader measure of ACT processes which influence psychological flexibility. As the BATD protocol incorporates an element of ACT, with emphasis on increasing healthy behaviours positioned within a values driven framework borrowed from ACT, the AAQ provides a way of exploring this.

The original, longer (16 item) version of questionnaire was used in order to capture more information and allow greater comparability with previous studies. The 16-item has been found to load onto two factors; the first factor has been interpreted as measuring mindfulness and acceptance whilst the second factor measures values-based actions. These two factors then load onto a secondary factor labelled “psychological flexibility” (Bond & Bunce, 2003).

Items are answered using a 7-point Likert scale, ranging from 1 (‘Never true’) to 7 (‘Always true’). Higher scores are intended to indicate a higher level of experiential avoidance and a lower level of acceptance of private events. The AAQ has been found to have moderate to high correlations with measures of depression, anxiety, general psychopathology and quality of life (Hayes et al., 2003). Correlations with the White Bear Suppression Inventory (Wegner, 1994), a measure of experiential avoidance ranged between 0.44 and 0.5. Hayes et al (2003) demonstrated that it had adequate internal consistency (α = 0.70) and good test-retest reliability (α= 0.64 over 4 months). The scale showed adequate internal consistency in the current study at Time 1 (Cronbach’s α= 0.70), Time 2 (Cronbach’s α= 0.62) and Time 3 (Cronbach’s α= 0.72).

3.3.5. Ruminative Response Style Questionnaire (RRS; Nolen-Hoeksema and Morrow, 1991)

The RRS (see Appendix E) is a subscale from the Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991) measuring ruminative responses to depressed mood by asking individuals what they generally do when they are feeling depressed. The items describe responses that are self-focused (e.g., "I think, 'Why do I react this way?' "), symptom focused (e.g., "I think about how hard it is to concentrate"), and focused on the possible consequences and causes of their mood (e.g., "I think, 'I won't be able to do my job if I don't snap out of this' "). The RRS is comprised of 22 items, with each item rated on a four-point Likert scale, ranging from 0 (‘Almost never’) to 4 (‘Almost always’). Higher scores indicate a greater degree of rumination in response to depressive mood.

The predictive validity of the RRS in relation to future depression has been demonstrated in both clinical and non-clinical populations (e.g. Nolen-

Hoeksema & Morrow, 1991; Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema, 2000). Studies have demonstrated the RRS to have good convergent validity (e.g. Roberts, Gilboa and Gotlib, 1998). High internal reliability for the RRS has been found, with Cronbach's *α* ranging from 0.89 (Nolen-Hoeksema & Morrow, 1991) to 0.92 (Nolan, Roberts & Gotlib, 1998). The RRS has been found to have good internal consistency, Cronbach's *α*= 0.89 (Nolen-Hoeksema & Morrow, 1991). The scale showed adequate to excellent internal consistency in the current study; Time 1 Cronbach's *α*= 0.88, Time 2 Cronbach's *α*= 0.63, Time 3 Cronbach's *α*= 0.91.

3.3.6. Cognitive Behavioural Avoidance Scale (CBAS; Ottenbreit & Dobson 2004)

Ottenbreit and Dobson (2004) developed the CBAS (see Appendix F) as a multidimensional measure of avoidance in relation to depression. It is a self-report measure consisting of 31 items, which are answered using a 5-point Likert scale. Items relate to one of four domains; Behavioural Social, Cognitive Nonsocial, Cognitive Social and Behavioural Nonsocial avoidance. Higher total scores are an indication of more avoidant behaviours.

Ottenbriet and Dobson (2004) demonstrated that the CBAS had good test-retest reliability (*α* = 0.92) over a 3-week period, using an undergraduate student sample population. The CBAS has been shown to have good convergent and divergent validity, with CBAS scores correlating positively with self-report measures of avoidance and negatively with an index of approach coping (Ottenbriet & Dobson, 2004). Ottenbriet and Dobson (2004) found the CBAS to have good internal consistency for the total scale and subscale scores. The Cronbach alpha's were as follows; Total score (*α* = 0.91), Behavioural Social (*α* = 0.86), Cognitive Nonsocial (*α* = 0.80), Cognitive Social (*α* = 0.78) and Behavioural Nonsocial (*α* = 0.75). In the current study, the total scale showed good to excellent internal consistency at all time points (Time 1 Cronbach's *α*= 0.94, Time 2 Cronbach's *α*= 0.95, Time 3 Cronbach's *α*= 0.92).

3.3.7. Sociodemographic data

Sociodemographic information was collected during the Time 1 session; education level, marital status, previous experience of depression, other mental health difficulties and previous therapy experiences (see Appendix G).

3.3.8. Approach-Avoidance Task (AAT; Rinck & Becker, 2007)

Rinck and Becker (2007) developed an experimental computer task to measure implicit approach and avoidance behaviours using a joystick. Initially used in the study of phobia disorders (e.g. Rinck & Becker, 2007), Vrijsen, Van Oostrom, Speckers, Becker and Rinck (2012) extended this experimental paradigm further to explore the impact of mood towards different emotional faces. Various research studies have already demonstrated that individuals will usually approach a reference object or stimulus when a positive outcome or affect is expected but avoid the reference objects or stimuli where a negative outcome or affect is expected to occur (e.g. Carver, Avivi & Laurenceau, 2008).

The aim of the AAT in this study was to explore whether approach and avoidance tendencies, as measured by the speed of the joystick in response to different facial expression faces presented on a computer screen, was affected by mood. Participants reaction times from initiation of a trial to disappearance of the picture was recorded and used as the primary dependent variable for this task. The speed of the joystick movement indicated the individual's behavioural approach and avoidance towards the presented picture.

The task was presented on a laptop using a screen resolution of 1024 x 728 pixels. A joystick was attached to the laptop and fixed on the table and moveable only within its Y-axis (front-back). Participants were instructed to either push or pull a joystick as fast as possible depending on the colour shading of the presented item. (See Figure 5 for the introduction screenshot of the task).

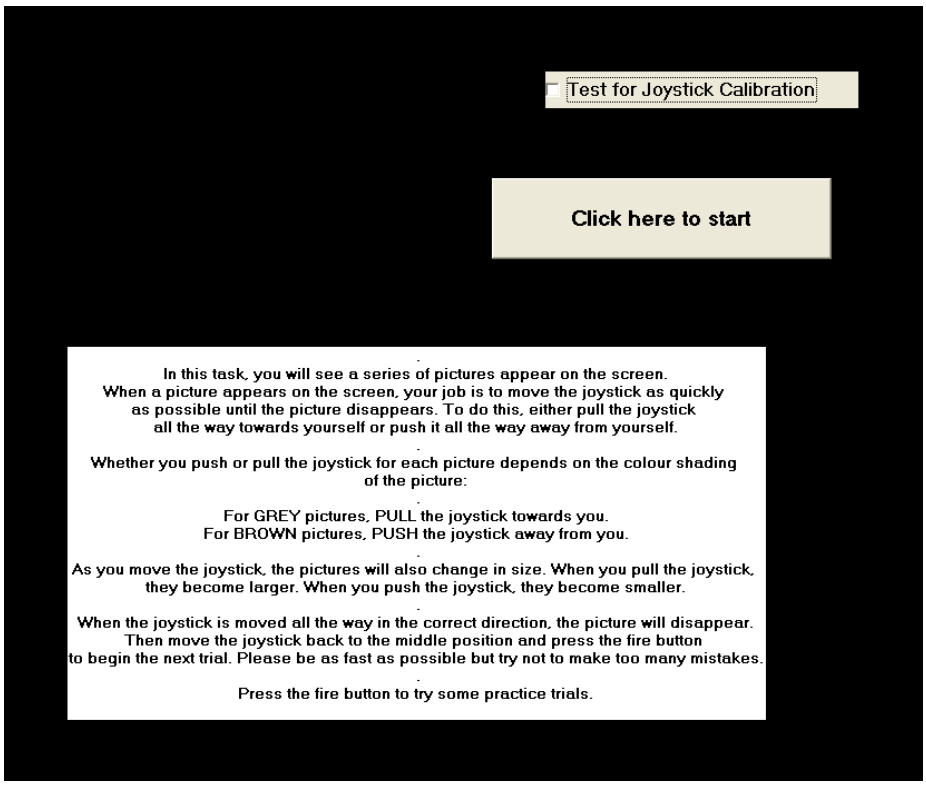


Figure 5. Introduction screenshot of the AAT.

Participants were instructed to pull the joystick towards them for grey shaded pictures, and push the joystick away from them for brown shaded pictures displayed. The 10 control pictures consisted of checkerboard patterns, shaded using either grey or brown colours (see Figure 6).

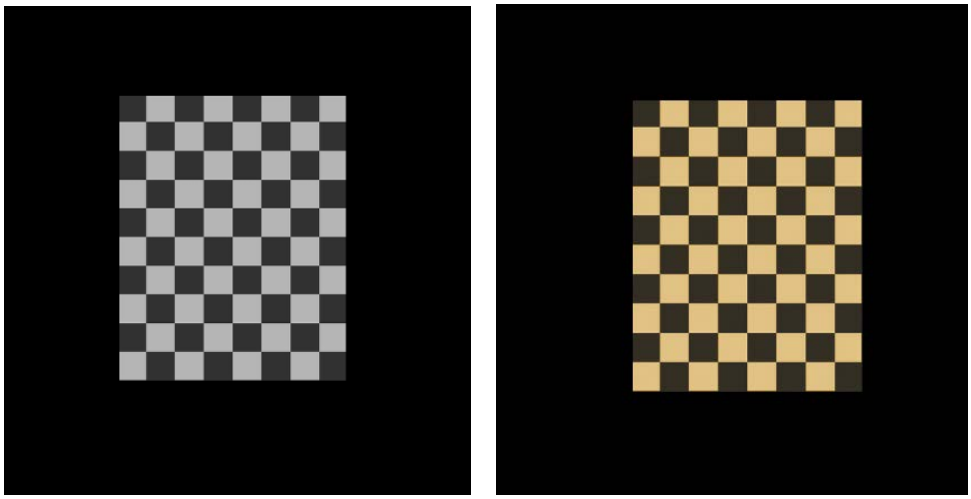


Figure 6. Grey and brown control checkerboard patterns for the AAT.

After completing the control pictures, participants were presented with a screen advising that they would be presented with 200 more pictures (see Figure 7), with a possible break, if required after 100 pictures.

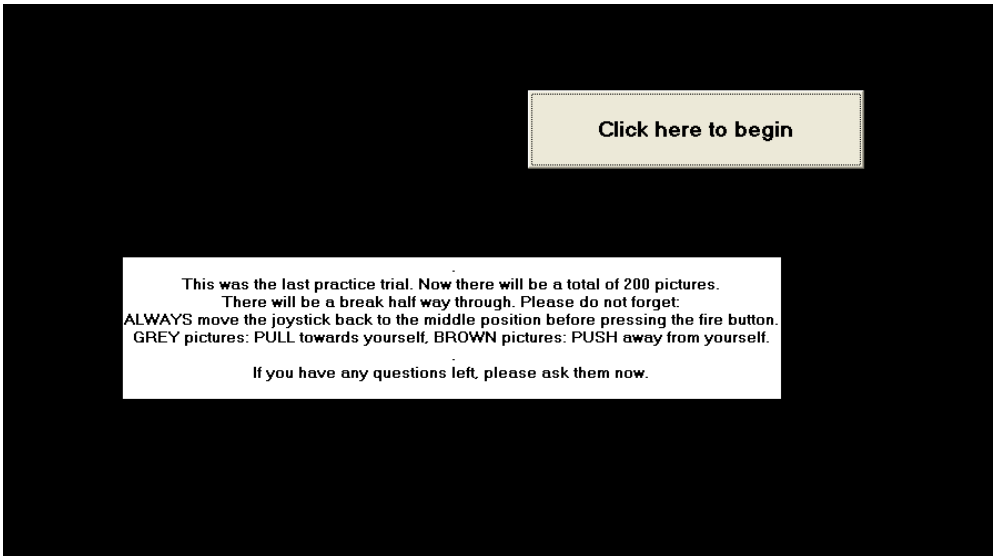
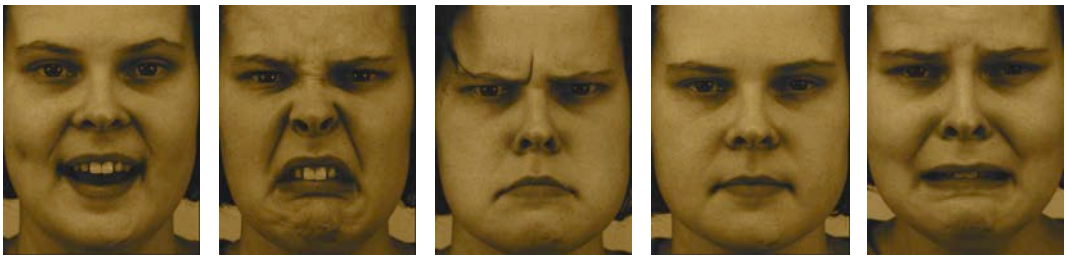


Figure 7. Last practice trial screenshot of AAT.

Photographs of 8 individuals were used (4 male and 4 female). Each individual expressed five different facial expressions; happy, disgust, sad, angry and neutral (see Figure 8). Two versions of each picture were created, using both brown and grey shading. The 10 control checkerboard patterns were also included. As instructed for the practice trial, participants were required to push the joystick away from them for brown shaded pictures or pull the joystick towards them for grey shaded pictures.



Happy Disgust Angry Neutral Sad

Figure 8. Five facial expressions as displayed by each individual in AAT.

A ‘zooming effect’, using five different sizes of each picture, was employed to create a visual impression of participants either approaching or avoiding the pictures. Pulling the joystick increased the size of the picture until it appeared to fill the entire screen (see Figure 9) and was classified as approach behaviour. Pushing the joystick decreased the size of the picture (see Figure 9), and was classified as avoidance behaviour.

Pulling joystick – approach behavioural tendency

Pushing joystick – avoidance behavioural tendency

Figure 9. 'Zooming' effect to create visual impression of behavioural approach or avoidance.

Once the joystick had been moved all the way in the correct direction, the picture would disappear. Participants were instructed to press a ‘fire’ button (located at the back of the joystick) to load the next picture onto the screen.

3.3.9. Timing of assessments

The use of the outcome measures at the different time points are summarised in Figure 10 below.

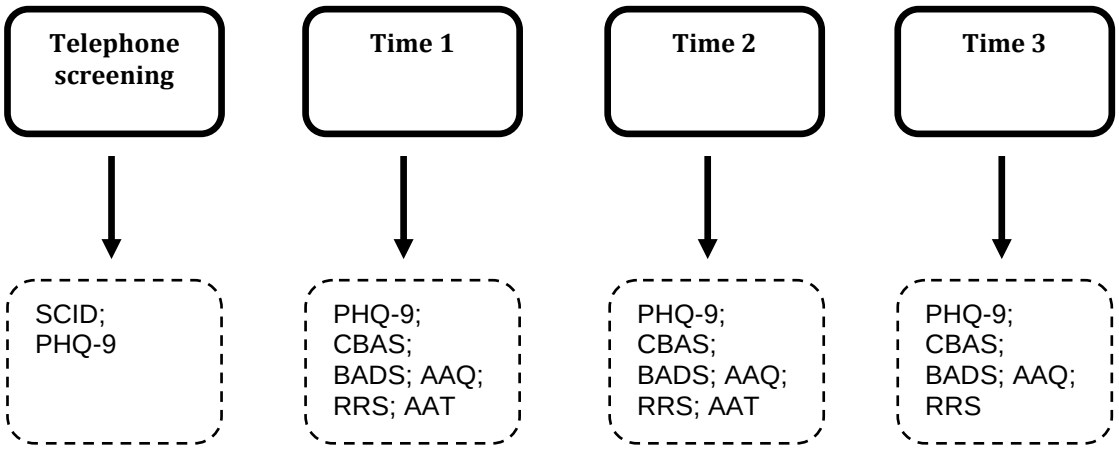


Figure 10. Use of outcome measures at different stages of the study.

3.4. Procedure

The experimental procedure consisted of five stages;

(i) Pre-screening - to invite participants to take part in the study.

(ii) Telephone screening - to establish if interested individuals met the inclusion criteria for the study.

(iii) Time 1 - Pre-treatment outcome measures were completed and participants randomised to a condition. Participants in the treatment condition received the treatment session at this time point.

(iv) Time 2 - Post treatment outcome measures were completed one week after Time 1.

(v) Time 3 – Follow up outcome measures were completed four weeks after Time 2 via an email link or post, depending on participant preference.

3.4.1. Invitation to participate in study

Allocated workers in the two psychological therapies services created spread sheets with details of patients using the following filters on their computer system; consented to contact for research purposes, scored above 10 on the Patient Health Questionnaire (PHQ-9) and had a diagnosis of depression recorded. These lists were generated on a 3 weekly basis and forwarded to the researcher using password-protected emails. Patients on these lists were

contacted via telephone by the researcher. Information about the study from the Participant Information Sheet (see Appendix H) was given and patients were asked if they wished to participate. Participants were given the opportunity to ask questions and given time to think before making the decision to participate in the study.

3.4.2. Telephone screening

Patients who wished to participate completed a telephone screening process with the researcher. This took approximately 20-30 minutes. The screening process consisted of the administration of the Major Depressive Disorder module from the SCID and the PHQ-9. Patients were also asked if any of the exclusion criteria applied to them e.g. did they have a current diagnosis of an eating disorder or were they currently receiving any therapy. If patients met the inclusion criteria they were invited to take part in the study and attend two sessions. Participants were either sent a confirmation email or letter, which contained a copy of the Patient Information Sheet.

If patients did not meet criteria, then this was explained to them and they were thanked for their time. If any risk issues came up during the screening process, further information was sought in order to provide the relevant service with detailed information. Patients with suicidal ideation assessed to be at risk were signposted to the necessary services e.g. local Accident and Emergency service or Samaritans telephone number and explained that these risk issues would be passed onto the relevant service. An email with the identified risk issues was sent to a clinician within the relevant service following the end of the screening call. Clinicians would make a note of the risk issues on the participants file and make follow up calls if necessary.

3.4.3. Time 1

Participants were given a verbal overview of what the session would entail and advised that they could leave the study at any time, without providing a reason and that this would not affect their care. Participants were given a Participant Information sheet to read and a Consent Form (see Appendix I) to sign. They were given a further opportunity to ask questions or to take additional time if they were unsure about participating in the study.

Once participants signed the consent form, they were asked to complete the self-report measures and demographic information sheet. Participants were asked for their GP contact details in order to let their GP know about their participation in the study (see Appendix J). After completion of the questionnaire pack, participants completed the AAT. Whilst the participant was completing the AAT, the researcher undertook the random allocation to either the treatment or waiting-list condition. A sealed envelope method was used, which involved having 40 sealed, brown envelopes with a treatment or waiting list control typewritten note inside. It was not possible to read anything through the envelopes. The envelopes were shuffled into a random order and an envelope was opened during the second half of the AAT. Randomisation was completed at this stage so that allocation could not bias any responses on the pre-treatment measures or the way in which the researcher interacted with the participant earlier in the procedure.

Treatment condition - Participants in the treatment condition were provided with one session of BATD, which lasted between 60 and 90 minutes. A modified version of the manualised treatment (see Appendix K), by Gawrysiak and Hopko (2009) was utilised. Gawrysiak and Hopko (2009) undertook major modifications in order to reduce the comprehensive BATD treatment manual (Hopko & Lejuez, 2007; Lejuez, Hopko, & Hopko, 2001) down to one treatment session. As a result of this reduced form of treatment and shorter time period, a non-progressive approach to behavioural activation was used whereby a larger number of behaviours were immediately targeted for change instead of utilising a graded approach to activity scheduling. In addition, the behavioural contracting strategies were omitted from this shortened treatment form, which would have been used to address and decrease the rewards associated with depressive behaviours.

BATD was introduced to participants, with a discussion of the different symptoms of depression, and an opportunity for participants to discuss their experience of symptoms. A rationale for how BATD works, extracted from the BATD protocol was provided. This was facilitated using a diagram from the original BATD manual (Lejeuz, Hopko & Hopko, 2001), as seen in Figure 11. Particular emphasis was placed on engaging in activities which would bring

either a sense of pleasure or accomplishment to help to reduce feelings of depression and self-esteem. Some psycho-education was provided, whereby possible etiological factors associated with the onset of depression were discussed.

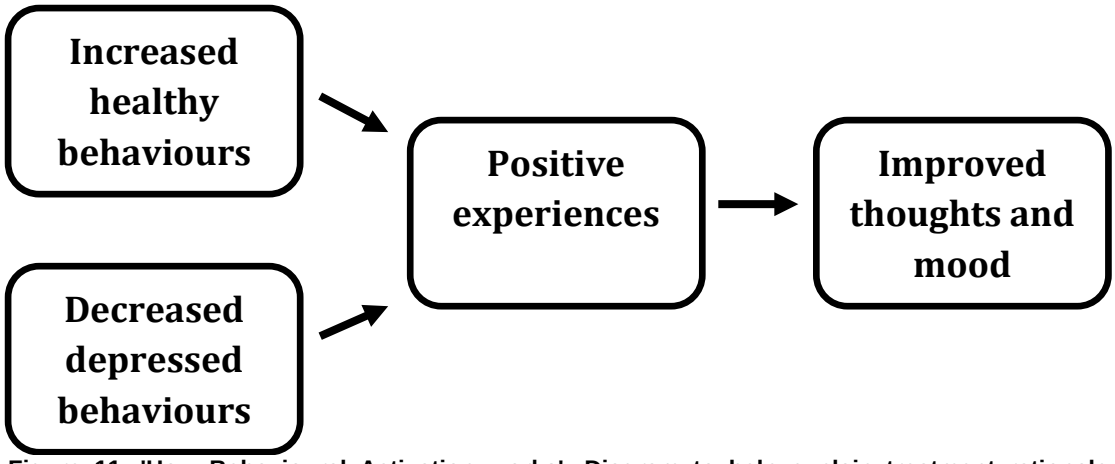


Figure 11. 'How Behavioural Activation works': Diagram to help explain treatment rationale (Lejuez et al., 2001).

The session then focused on identifying and scheduling potential activities using the “life goal/area assessment” approach. This involved discussion of the following life areas; family relationships, social relationships, intimate relationships, education/learning/training, hobbies/recreation/leisure, physical/health issues, spirituality and mental health issues. By discussing these different life areas, goals were collaboratively generated by the participant and researcher. Participants were encouraged to think of specific, measureable, action-orientated, realistic and time limited goals e.g. ‘I will go running in the local park for 20 minutes on 3 days’. An assessment sheet was used to help facilitate this and to ensure that all participants were being asked similar questions (see Appendix L). Using this approach, participants were guided towards identifying activities which would bring them a sense of pleasure and/or accomplishment, in line with their values and beliefs.

Once structured and appropriate activities for the coming week were identified, the behavioural checkout sheet (see Appendix M) was populated. Participants

were encouraged to think of 3 to 5 activities to implement over the next 7 days. On the behavioural checkout sheet participants were asked to specify the frequency and duration of each goal. This sheet was used as a monitoring tool during the one-week treatment interval. Participants were asked to attempt to engage in the selected activities over the coming week. The importance of monitoring and completing the behavioural checkout sheet on a daily basis was emphasised. Potential barriers to success were discussed and problem solved. Participants were then invited to complete these goals over the coming week and return for their Time 2 session with the completed behavioural checkout sheet.

Waiting list control condition - Participants were advised that they would be receiving the treatment session in one month's time. They were thanked for their time and reminded that the Time 2 appointment would take place the following week.

3.4.4. Time 2

Participants were invited to attend a Time 2 appointment one week after their Time 1 session. Where this was not possible, an appointment was made when the participant was next available. Participants were asked whether they had received any treatment from IAPT during the one-week interval period. One participant did start treatment during this time period and was excluded from the study. Preference for contact (email or post) was established with participants for the follow up questionnaires. Participants also received £20 reimbursement during this session.

Treatment condition – Participants were asked to complete the outcome measures. Their completed behavioural checkout sheet was then reviewed. Participants were asked for feedback on the treatment session and the treatment interval. If participants wished to continue setting weekly goals for themselves, they were given blank copies of the behavioural checkout sheet. After this discussion participants were provided with their reimbursement.

Waiting list control condition – Participants were asked to complete the outcome measures. Participants were reminded that after completing the follow-

up questionnaires they would be able to receive the BATD treatment if they wished to do so.

3.4.5. Time 3

Four weeks after attending the Time 2 (post-treatment) appointment, participants were contacted by their preferred method of contact to complete the follow up outcome measures. Participants contacted via email were sent a link to an online survey website where they completed the five questionnaires. Once participants completed the questionnaires, a notification email was sent to the researcher. Participants contacted via post were sent a hard copy of the five questionnaires as well as a prepaid envelope to return the questionnaires in, to the researcher.

3.4.6. Waiting list control treatment sessions

Once participants in the waiting list control group completed the follow-up questionnaires, the researcher contacted them to offer the shortened BATD treatment session. If participants wished to receive the session, then an appointment was booked with them.

3.5. Ethical Issues

3.5.1. Ethical approval

Ethical approval for the study was granted by the London City Road and Hampstead NRES ethics committee (REC reference – 13/LO/0018) on 15th April 2013 (see Appendix N).

3.5.2. Ethical considerations

All potential participants were given detailed information about what would be involved in the study and had the opportunity to ask questions and have time to consider whether or not to participate. Written consent was provided before participation in the study. To ensure confidentiality, data was anonymised on the computer file. Data was stored according to university guidelines.

Potential risks to participants were identified prior to the start of the study and steps were taken to minimise any possible risks or burdens that could occur as a result of participating. The task procedures had all been used in previous

studies with no reported problems or unnecessary burden on participants. However, it was judged that participation in the research study would not be suitable for participants at significant risk of imminent self-harm or attempted suicide, who should be receiving urgent assessment and care. As clinical responsibility was with the psychological therapy services, it was agreed that details of patients who scored above 2 on item 9 of the PHQ-9 ("Thoughts that you would be better off dead, or of hurting yourself") at the telephone screening stage would be passed on to the service for recording onto their information system and to undertake further assessment if necessary. However the researcher could use their clinical judgement to invite these participants to take part in the study if this was felt to suitable, following assessment of their suicidal risk and protective factors. Participants were invited to participate if there were no clear means, intention or plans to act on their suicidal ideation thoughts. For participants whom it felt that participating in the study would not be suitable, they were signposted to services e.g. local A&E that they could access in case these thoughts or feelings escalated to the point that they would be unable to guarantee their safety.

3.6. Data Handling and Statistical Analyses

The main focus of the statistical analyses was on Time 1 and Time 2 data, across all measures. This was due to the primary interests of this study in exploring changes following one session of behavioural activation and one week treatment interval. Supplementary statistical analyses were completed using Time 3 data.

3.6.1. Data screening

The identified approach was to screen all data for missing values, accurate input and normality. Assumptions of normality were checked using frequency histograms, Q-Q plots and boxplots. Data for the self-report measures (PHQ-9, CBAS, RRS, AAQ and BADS) was normally distributed. Data for the AAT was skewed, which was corrected for using procedures described by Vrijsen et al. (2012). Participants with an overall mean reaction time of >1000 ms across both time-points (n=3) and with more than 20% error rate (n=1) were excluded, resulting in the analysis of 36 participants data (treatment n=17, control n=19).

3.6.2. Planned statistical analyses

The planned statistical analyses aimed to: (a) examine group differences on a self report measure of depression, (b) explore group differences on reaction times for approach and avoidance behaviours using data from the AAT and self reported rumination, behavioural activation and avoidance, (c) explore whether changes in approach and avoidance mediated changes in depression symptomatology as measured by the PHQ-9.

All analyses were completed using the Statistical Package for the Social Sciences (SPSS 22, SPSS Inc., Chicago, IL, USA). Parametric statistical tests were used for normally distributed data, otherwise non-parametric equivalent tests were employed. Chi square analyses were used to establish any baseline differences in terms of demographic variables to ensure that both groups were not significantly different. Analyses of variance and multivariate of analyses were used to explore differences between the treatment and control group across the three time points on self report measures of avoidance and the experimental task. Associations between questionnaire scores and reaction time scores on the experimental computer task were explored using correlational and regression analyses. Meditational analyses were used to explore whether changes in approach or avoidance could predict changes in depressive symptoms.

The PROCESS program was used for mediational analysis (Hayes, 2013) using the Preacher and Hayes (2004) bootstrapping approach. PROCESS is a freely available computational tool, which once downloaded as a syntax file, is used to complete mediation and moderation analysis within SPSS. PROCESS extends the capabilities of SPSS by generating direct and indirect effects in single and multiple variable mediation and moderation models. Kappa squared was used as a measure of effect size, which is defined as the ratio of indirect effect relative to the maximum possible value in the data, given the observed variability in all factors and their intercorrelations (Hayes, 2013). Values closer to 1 represent bigger indirect effect sizes. Supplementary analyses were used to explore the data further by looking at associations between experimental and self-report measures and treatment compliance.

4. Results

Statistical analyses focused on Time 1 and Time 2 data, across all measures. This was due to the primary interests of this study in exploring changes following one session of behavioural activation and one week treatment interval. Additional statistical analyses were completed using Time 3 data.

4.1 Participant characteristics of the sample

A total sample of 48 patients was recruited from two local primary care psychology services. Eight participants were excluded due to non-attendance (n=5), receiving treatment between Time 1 and Time 2 (n=1) or no longer meeting inclusion criteria at Time 1 (PHQ-9 score below 10, n=2). A sample of 40 participants was used for analyses relating to the self-report measures. A sample of 36 participants was used for analyses relating to the Approach Avoidance task (4 participants were excluded following procedures described by Vrijsen et al., 2012, see Methods section for further details). Figure 11 depicts participant flow through the study.

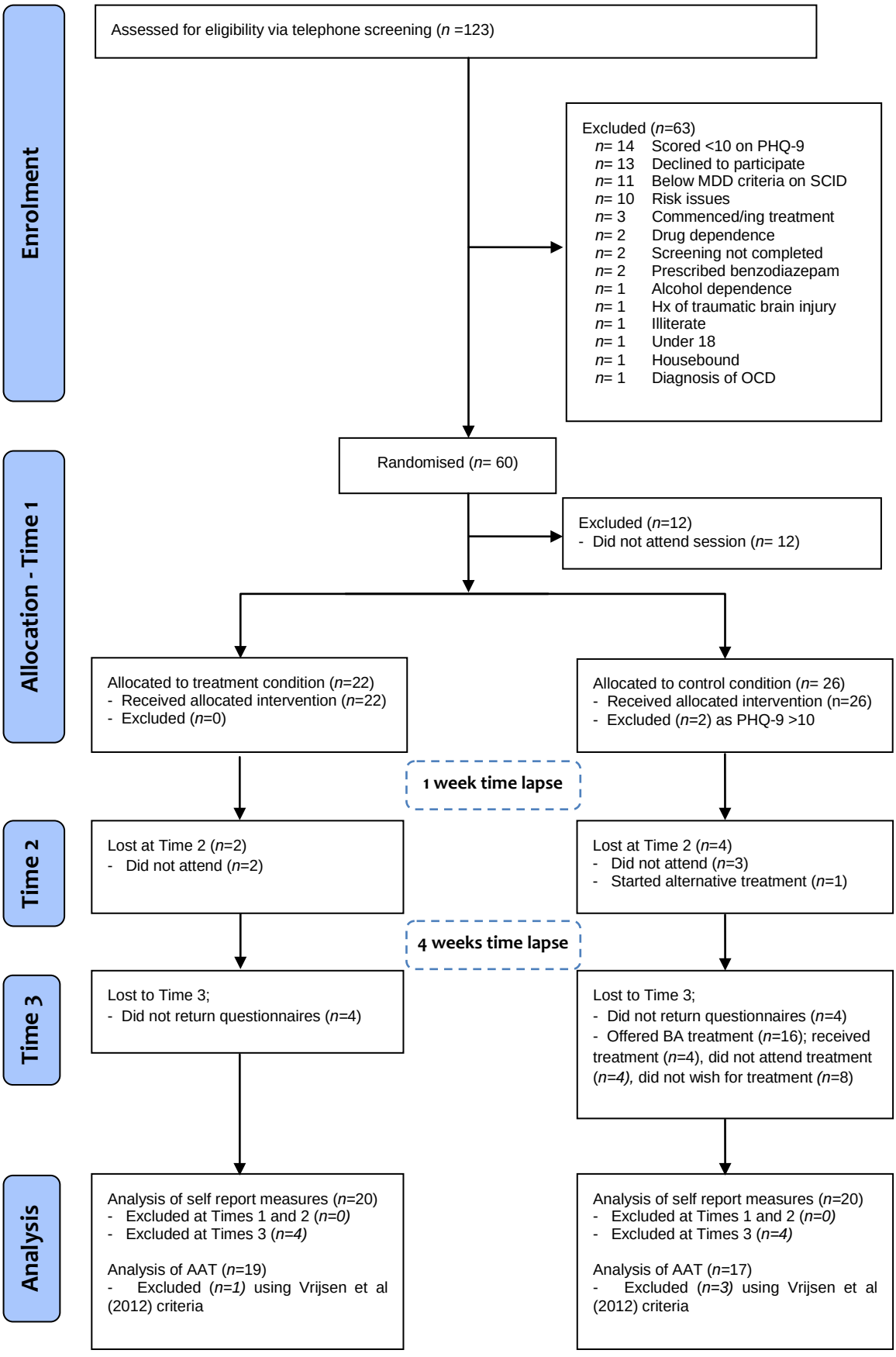


Figure 12 CONSORT participant flow diagram.

4.1.1. Exploring baseline differences in demographic variables

Tests of baseline differences in terms of socio-demographic variables were investigated using chi square test of independence for categorical variables. In cases where the assumptions of the chi-square test of independence were violated due to the small sample size, the exact chi-square figure has been reported instead. The two sample groups did not differ as a function of the baseline socio-demographic characteristics e.g. gender and marital status (see Table 2).

Table 2. Group differences on demographic characteristics.

Characteristic	Treatment (n=20)	Waiting list control (n=20)	Test statistic and p value
Borough			$\chi^2 = 1.91$, $p=0.17$
Lambeth	12 (60%)	16 (80%)	
Southwark	8 (40%)	4 (20%)	
Age	34.90 years (SD=10.9)	37.60 years (SD=8.4)	Wilks λ =0.58, p=0.55.
Gender			$\chi^2 = 0.11$, $p=0.74$
Female	13 (65%)	14 (70%)	
Male	7 (35%)	6 (30%)	
Screening PHQ-9 score (mean)	17.75 (SD=4.74)	16.65 (SD=3.69)	t= 0.82, p=0.42
Moderate symptoms (10-14)	7 (35%)	5 (25%)	
Moderately severe symptoms (15-19)	5 (25%)	12(60%)	
Severe symptoms (20-27)	8 (40%)	3 (15%)	
Marital status			$\chi^2 = 2.62$, $p=0.77$ [a]
Single	17 (85%)	14 (70%)	
Married	2 (10%)	2 (10%)	
Divorced	1 (5%)	2 (10%)	
Widowed	0	1 (5%)	
Separated	0	1 (5%)	
Ethnicity			$\chi^2 = 3.04$, $p=0.69$ [a]
White	11 (55%)	12 (60%)	
Black African	3 (15%)	3 (15%)	
Black Caribbean	2 (10%)	0	
Pakistani	0	1 (5%)	
Other	4 (20%)	4 (20%)	
Occupational status			$\chi^2 = 3.03$, $p=0.50$ [a]
Full time employed	5 (25%)	8 (40%)	
Part time employed	5 (25%)	1 (5%)	
Self employed	1 (5%)	2 (10%)	
Unemployed	6 (30%)	5 (25%)	
In education	3 (15%)	4 (20%)	
Education level			$\chi^2 = 8.48$, $p=0.14$ [a]
High school	3 (15%)	3 (15%)	
NVQs	2 (10%)	6 (30%)	
A levels	6 (30%)	0	
Diploma	1 (5%)	2 (10%	
Undergraduate degree	5 (25%)	5 (25%)	
Postgraduate degree	3 (15%)	4 (20%)	
Previous experience of depression			$\chi^2 = 1.03$, $p=1.00$ [a]
Yes	15 (75%)	14 (70%)	
No	5 (25%)	5 (25%)	
Not answered	0	1 (5%)	
Previous access to psychological treatment			$\chi^2 = 0.42$, $p=0.52$
Yes	11 (55%)	13 (65%)	
No	9 (45%)	7 (35%)	
Prescribed anti-depressant medication			$\chi^2 = 0.00$, $p=1.00$ [a]
Yes	9 (45%)	9 (45%)	
No	11 (55%)	11 (55%)	
History of other mental health problems			$\chi^2 = 0.00$, $p=1.00$ [a]
Yes	4 (20%)	4 (20%)	
No	16 (80%)	16 (80%)	

[a] Exact chi-square figure has been reported.

4.1.2. Exploring baseline clinical characteristics in relation to demographic variables

Analyses were undertaken to investigate differences on baseline clinical characteristics in relation to gender, ethnicity (white versus non-white) and age. A series of multivariate analyses of variance (MANOVAs) were conducted. The demographic variables were used as the independent variables whilst total scores on self-report measures at Time 1 were used as the dependent variables (PHQ-9, CBAS, AAQ, RRS and BADS).

The multivariate effect of the combined dependent variables on gender was non-significant, Wilks λ =0.76, *F* (5, 34)= 2.16, *p*=0.08. The multivariate effect of the combined dependent variables on ethnicity was non-significant, Wilks λ =0.96, *F* (5, 34)= 0.32, *p*=0.89. The multivariate effect of the combined dependent variables on age was also non-significant, Wilks λ =0.58, *F* (20, 104)= 0.93, *p*=0.55.

As there were no main effects of gender, ethnicity or age, subsequent analyses did not need to adjust for these factors.

4.2. Pre- to Post (Time 1 to Time 2) Treatment Changes

Hypothesis 1 suggested that in comparison to control participants, participants in the treatment condition would show greater changes in depressive symptoms during the intervention period. Figure 13 shows changes in PHQ-9 symptoms for both groups from Time 1 to Time 2 (see Table 3 for mean scores on all self-report outcome measures at Times 1 and 2).

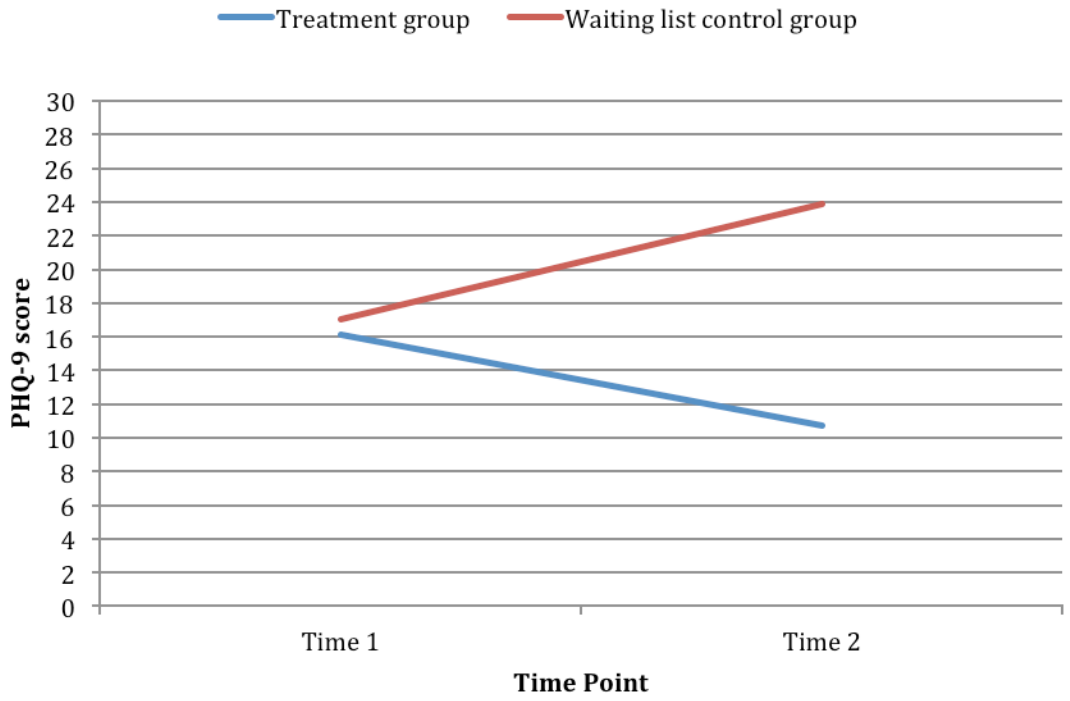


Figure 13. PHQ-9 scores at Time 1 and Time 2.

A repeated measures ANOVA assessed the impact of condition (treatment or control group) on participants' scores on the PHQ-9, across two time periods (Time 1 and Time 2). There was a significant main effect of time, F (1, 38) = 29.85, p<0.01, partial η^2=0.44. There was a significant main effect of condition, F (1, 38) = 4.43, p=0.04, partial η^2=0.10. There was a significant interaction between condition and time, F (1, 38) = 15.82, p<0.01, partial η^2=0.29.

Post hoc comparisons were used to explore the data further. A Bonferroni correction was used to control the familywise error rate. Using the Bonferroni correction the adjusted critical alpha level was p=0.01 (0.05/4). Post hoc comparisons indicated that the two groups (treatment and control) were significantly different in PHQ9 scores at Time 2, t (38) = -3.12, p=0.003 but not at Time 1, t (38) = -0.59, p=0.56. Paired t-tests indicated that there was a significant difference between Time 1 and Time 2 PHQ-9 scores for the treatment group, t (19) = 5.79, p<0.01, but not for the control group, t (19) = 1.28, p=0.22.

Table 3. Test statistics and scores on PHQ-9, CBAS, AAQ, RRS and BADS at Times 1 and 2.

	Time 1		Time 2		Test statistics[†]
Measure	Treatment (n=20)	Control (n=20)	Treatment (n=20)	Control (n=20)	
Patient Health Questionnaire-9	16.15 (4.78)	17.00 (4.32)	10.75 (5.60)	23.85 (8.92)	Effect of time – F (1, 38) = 29.85, p<0.01** Effect of condition- F (1, 38) = 4.43, p=0.04* Interaction – F (1, 38) = 15.82, p<0.01**
Cognitive Behavioural Avoidance Scale					Effect of time – F (1, 38) = 5.76, p=0.02*
Behavioural social	25.05 (9.08)	23.85 (9.11)	22.60 (9.17)	23.85 (8.92)	Effect of condition- F (1, 38) = 0.00, p=0.95
Behavioural non-social	18.50 (4.16)	18.55 (4.30)	16.65 (4.88)	18.15 (4.26)	Interaction – F (1, 38) = 2.41, p=0.13
Cognitive social	21.25 (8.28)	19.30 (6.89)	18.60 (8.54)	19.05 (6.03)	
Cognitive non-social	30.50 (9.67)	29.20 (8.82)	28.45 (9.61)	28.10 (8.37)	
Total	105.85 (25.61)	101.95 (22.24)	97.00 (26.14)	100.05 (21.43)	
Acceptance and Action Questionnaire	79.10 (11.13)	80.30 (12.27)	72.25 (9.92)	77.20 (11.35)	Effect of time – F (1, 38) = 9.98, p<0.01** Effect of condition- F (1, 38) = 0.22, p=0.64 Interaction – F (1, 38) = 0.12, p=0.74
Ruminative Response Scale					Effect of time – F (1, 38) = 0.004, p=0.95
Depression	35.70 (6.30)	35.30 (5.55)	34.85 (9.21)	37.00 (5.94)	Effect of condition- F (1, 38) = 0.12, p=0.74
Reflection	12.50 (4.24)	11.85 (3.36)	12.10 (3.34)	11.25 (2.53)	Interaction – F (1, 38) = 2.15, p=0.15
Brooding	14.60 (3.46)	14.30 (3.08)	13.60 (3.41)	15.65 (2.62)	
Total	62.80 (11.56)	61.45 (10.63)	60.55 (11.40)	63.90 (8.43)	
Behavioural Activation for Depression Scale	14.35 (9.16)	16.20 (9.56)	17.85 (7.37)	14.95 (7.67)	Effect of time – F (1, 38) = 7.13, p=0.01** Effect of condition- F (1, 38) = 2.68, p=0.11 Interaction – F (1, 38) = 7.85, p<0.01**
Activation	25.95 (9.40)	29.15 (10.35)	21.10 (8.84)	27.70 (9.44)	
Avoidance/Rumination	15.35 (6.04)	15.75 (7.03)	11.55 (5.32)	16.10 (6.27)	
Work/school impairment	12.00 (7.83)	13.80 (8.18)	9.55 (7.91)	14.00 (8.60)	
Social impact	69.05 (23.87)	65.50 (23.51)	83.65 (20.04)	65.15 (23.91)	
Total					

[†]Analyses computed using total scale scores only; * = significant at p=0.05 level, ** = significant at p=0.01 level.

ANOVA completed with PHQ-9. MANOVA completed with CBAS, AAQ, RRS and BADS – univariate analyses reported.

4.3. Changes in Approach Avoidance Task (AAT) scores

The second hypothesis suggested that in comparison to participants in the waiting list control condition, participants in the treatment condition would show significant increases in approach of positive emotional faces and reductions in avoidance of negative emotional faces, and greater improvements in avoidance and rumination self report measures after one session of behavioural activation and one week treatment interval.

4.3.1. Change on other self-report measures (CBAS, RRS, AAQ and BADS)

Differences between the treatment and waiting list control group on the self-report measures (CBAS, AAQ, RRS and BADS) were investigated (see Table 3).

A series of repeated measures mixed design ANOVAs were performed using the self-report measures (CBAS, RRS, AAQ and BADS) to investigate differences between groups (treatment and control) across time points (Times 1 and 2) (See Table 3 for test statistics). The within subjects factor was the total scale score for the self-report measure and the between subjects factor was condition.

There were no significant main effects of condition. There was a significant main effect of time on the CBAS. All other main effects of time were non-significant. There was a significant interaction between time and condition for BADS scores. All other interactions were non-significant. Post hoc comparisons using the Bonferroni correction were completed to investigate the significant interaction for BADS scores further. The adjusted critical alpha level was p=0.025 (p=0.05/2). Paired samples t-tests indicated non-significant differences between Time 1 and 2 BADS scores for the waiting list control group, t (19) = 0.10, p=0.93. Paired samples t test found a significant difference between Time 1 and Time 2 BADS scores for the treatment group, t (19) = -3.75, p=0.001, with an increase in BADS score at Time 2, indicating increased activation.

4.3.2. Group differences on behavioural approach and avoidance behavioural tendencies (AAT)

Table 4 shows the mean reaction times for different facial expressions (happy, sad and angry) on the AAT before and after the treatment interval of one week.

Table 4. Mean reaction times in milliseconds (with standard deviations) depending on condition, picture type and response direction at Times 1 and 2.

Picture Type	Time 1		Time 2	
	Treatment (n=17)	Control (n=19)	Treatment (n=17)	Control (n=19)
Angry Push	716.88 (98.82)	702.37 (104.17)	629.62 (76.33)	653.39 (131.50)
Angry Pull	760.68 (139.47)	747.63 (112.34)	667.24 (124.60)	691.53 (164.82)
Happy Push	737.47 (125.84)	723.37 (104.61)	641.56 (87.86)	660.32 (125.76)
Happy Pull	767.47 (136.71)	735.18 (103.17)	642.44 (80.52)	680.47 (140.56)
Sad Push	725.68 (129.65)	725.26 (90.92)	631.56 (91.25)	649.21 (132.76)
Sad Pull	766.18 (173.10)	750.03 (137.40)	653.88 (115.84)	660.47 (152.58)

Figure 14 shows the AAT effect scores for both groups, before and after treatment. Effect scores were calculated for each participant by subtracting the mean reaction time of the pull trials from the mean reaction time of the corresponding push trials (see Figure 3). Separate effect scores were calculated for each type of facial expression. Effect scores indicate the relative strength of approach and avoidance behavioural tendencies: more negative values indicate more negative reactions, indicating stronger avoidance. In comparison, positive values indicate more positive reactions, that is, stronger approach behaviours. The values shown on Figure 3 indicate that the strongest behavioural responses occurred in relation to angry valence stimuli at both time-points, and that these were avoidant responses.

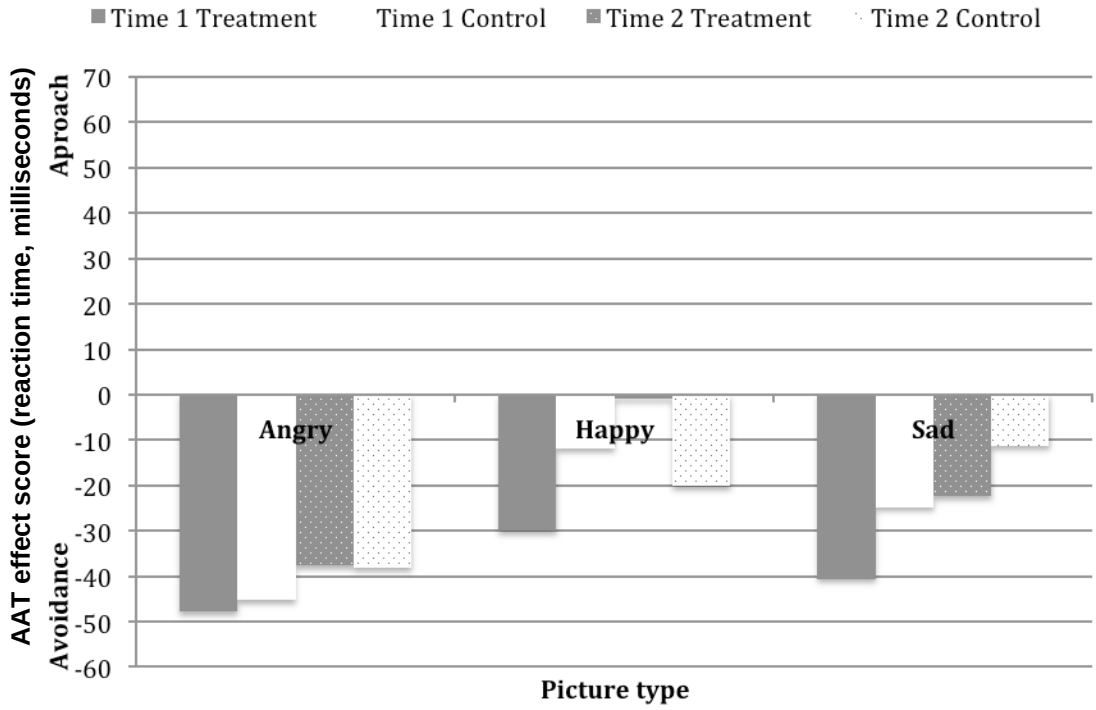


Figure 14. AAT effect scores for each condition and time-point

Notes on Figure 14

More negative values indicate more negative reactions, indicating stronger avoidance. Positive values indicate more positive reactions, that is, stronger approach behaviours.

A series of repeated measures mixed design ANOVAs using different valence factors (sad, angry, happy) were performed to investigate differences between condition (treatment and control) across different time points (Times 1 and 2). (See Table 5 for test statistics). The within subjects factor was the valence effect score and the between subjects factor was condition.

Table 5. Test statistics for series of repeated measures ANOVAs using AAT valence effect scores.

Valence	Effect of time	Effect of condition	Interaction
Angry	F (1, 34) = 0.25, p=0.62	F (1, 34) = 0.02, p=0.97	F (1, 34) = 0.001, p=0.97
Happy	F (1, 34) = 1.27, p=0.27	F (1, 34) = 0.001, p=0.98	F (1, 34) = 4.13, p=0.05*
Sad	F (1, 34) = 0.71, p=0.41	F (1, 34) = 0.20, p=0.66	F (1, 34) = 0.02, p=0.90

*= significant at p=0.05 level

There were no significant main effects of time or condition for each of the valence factors. There were no significant interactions between time and condition for sad and angry faces. There was a significant interaction between time and condition for happy faces, F (1, 34) = 4.13, p=0.05. Post hoc comparisons using the Bonferroni correction were completed to investigate this interaction further. The adjusted critical alpha level was p=0.025 (p=0.05/2). Paired samples t-tests indicated non-significant differences between Time 1 and 2 for the waiting list control group, t (18) = 0.65, p=0.53. The paired samples t-test for the treatment group was initially significant but the use of the adjusted critical alpha level rendered the results non-significant, t (16) = -2.21, p=0.04.

4.4. Mediation of change in symptoms of depression by changes in approach avoidance

The third hypothesis suggested that the degree of changes in approach and avoidance would predict changes in depressive symptoms and unhelpful beliefs.

Correlations were initially used to explore associations between changes in AAT effect scores and PHQ-9 scores. Mediational analyses were then computed using AAT effect change scores and PHQ-9 change scores[2]. This analysis utilised Time 2 data instead of Time 3 data, as Time 2 data was the main outcome time-point in this study. The possibility of confounding factors at Time 3, such as start of treatment, either in a private service or the primary care psychology service, meant that it was not suitable to use data from this time-point. Furthermore, attrition at Time 3 led to a reduced sample size (n=36) thereby limiting the feasibility of conducting mediational analyses.

4.4.1. Correlations between changes in symptoms of depression and change in AAT effect scores

Correlations were used to explore associations between change on AAT effect scores (across all valences) and change in PHQ-9 scores (see Table 6).

[2] Change scores were calculated by subtracting Time 1 score from Time 2 score for AAT and self report measures.

Table 6. Correlations between change on AAT effect scores and depressive symptoms between Times 1 and 2.

Change score (Time 1 to 2)	Change between Times 1 and 2 (n=36)			
	Angry effect score	Happy effect score	Neutral effect score	Sad effect score
Patient Health Questionnaire-9	0.002	-0.332*	-0.034	-0.052

*= significant at 0.05 level.

There was a significant negative correlation between change for the happy valence stimuli and change in PHQ-9 score, r= -0.33, p=0.05. This suggests that more positive reactions to happy valence stimuli (indicating stronger approach behaviour) was associated with a decrease in PHQ-9 scores between Times 1 and 2. Correlations for the other valence stimuli were non-significant.

4.4.2. Mediation analyses using AAT effect scores

An exploratory analysis was undertaken in order to explore whether changes in depressive symptoms were mediated by changes in approach and avoidance behavioural tendencies on the AAT task (see Figure 15). The initial causal variable was condition (treatment or control) outcome variable was change in PHQ-9 symptoms (between Time 1 and Time 2) and proposed mediating variables were changes in approach avoidance behavioural tendency (between Time 1 and Time 2) by valence (happy faces). Mediational analysis was completed with happy valence stimuli as this was the only significant correlation (see Figure 16).

Mediational analyses were computed using the PROCESS program for SPSS (Hayes, 2013) using the bootstrapping approach developed by Preacher & Hayes (2004) (see Methods chapter for more details).

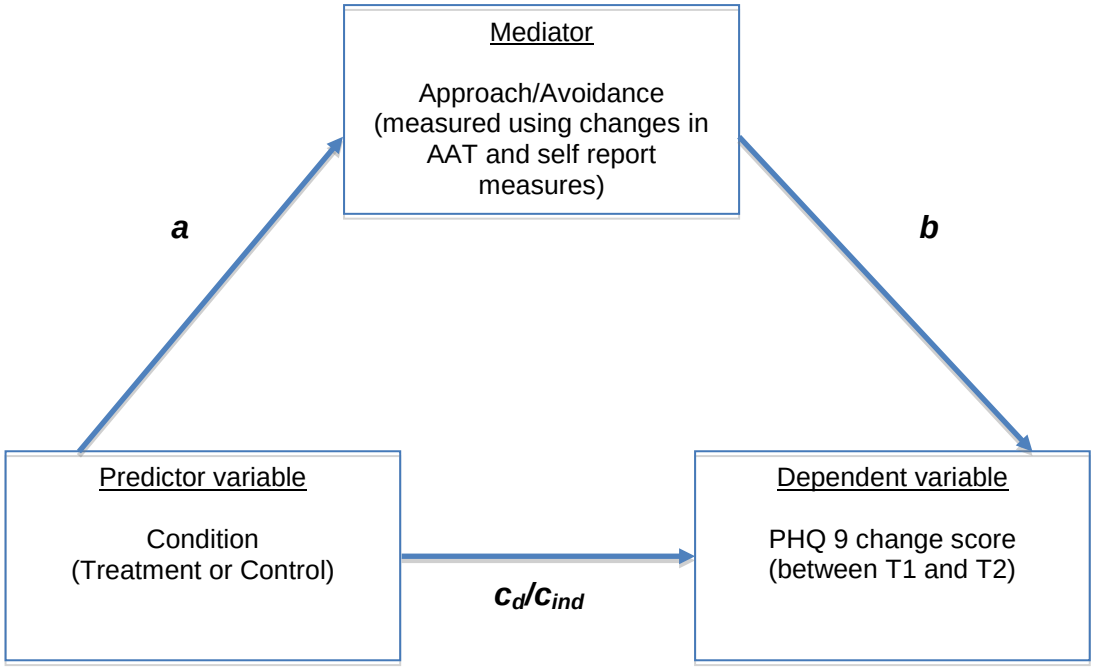


Figure 15. Mediation pathway for relationship between condition and change in PHQ-9 as mediated by approach avoidance behavioural tendencies.

Notes on Figure 15.

Path a= Direct effect of Condition on Approach Avoidance behaviour.

Path b= Direct effect of Approach Avoidance behaviour on PHQ-9 change score.

Path c_d= Direct effect of Condition on PHQ-9 change score.

Path c_{ind}= Indirect effect of Condition on PHQ-9 change score mediated through Approach Avoidance behaviour.

There was a significant positive direct effect of condition on PHQ-9 change scores, β= 0.59, p<0.01. There was a significant negative direct effect of change in happy valence effect score on PHQ-9 change score, β= -0.33, p=0.05. The indirect effect of change in happy valence effect score on change in PHQ-9 was non-significant, β_{ind} =0.052, 95% bootstrapped CI (-0.020, 0.211).

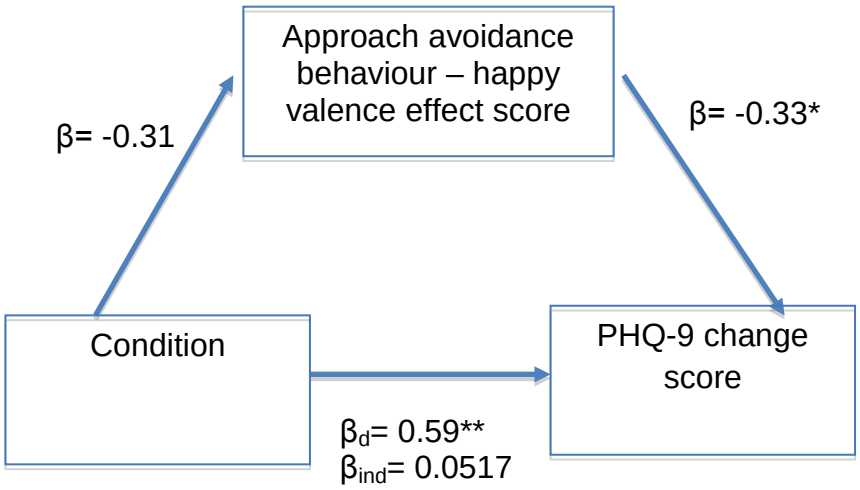


Figure 16. Mediation pathway for happy valence effect score.

Notes on Figure 16.

** = significant at p<0.01 level, * = significant at p<0.05 level.

Standardised β coefficients reported.

4.4.3. Correlations between change in symptoms of depression and self report measures of avoidance

Correlations were used to explore associations between change in PHQ-9 scores and changes in the other self-report measures of avoidance (CBAS, BADS, AAQ and RRS) (see Table 7).

Table 7. Correlations between change in depressive symptoms and self report measures of avoidance between Times 1 and 2.

Change score (Time 1 to 2)	Change between Times 1 and 2 (n=40)			
	Cognitive Behavioural Avoidance Scale	Acceptance and Action Questionnaire	Ruminative Response Scale	Behavioural Activation for Depression Scale
Patient Health Questionnaire-9	0.39*	0.10	0.52**	-0.53**

*= significant at *p*=0.05 level.

** = significant at *p*=0.01 level

There was a significant positive correlation between change in PHQ-9 and CBAS, *r*= 0.39, *p*=0.01. This indicates that a decrease in depressive symptoms was associated with a decrease in CBAS score between Time 1 and 2, which represents reduced cognitive and behavioural avoidance. Similarly, there was a significant positive correlation between change in PHQ-9 and RRS scores, *r*= 0.52, *p*=<0.01. Again, this suggests that a decrease in symptoms of depression was linked to a decrease in RRS score between Time 1 and 2, indicative of reduced rumination. There was a significant negative correlation between change in PHQ-9 and BADS scores, *r*= -0.53, *p*=<0.01. This indicates that a decrease in depressive symptomatology was associated with an increase in BADS score between Time 1 and 2, which indicates greater activation.

4.4.4. Mediation analyses using self report measures of avoidance

Further analyses were computed to explore whether changes in depressive symptoms were mediated by changes in self report measures of avoidance. Like the previous mediation analysis using AAT effect scores, the initial causal variable was condition (treatment or control), and outcome variable was change in PHQ-9 symptoms (between Time 1 and Time 2). In this mediation analysis, the proposed mediating variables were changes between Time 1 and Time 2 on self-report measures of avoidance (CBAS, BADS, AAQ and RRS).

Correlations between change in PHQ-9 and change in AAQ scores were non-significant. This indicated that scores in this self report measure of avoidance were be unlikely to mediate change in symptoms of depression, thus mediation analyses was not computed with this variable. Mediation analyses were computed with the other self report measures of avoidance.

Mediation analysis using change in CBAS scores

Mediation analysis was calculated to explore whether changes in Cognitive Behavioural Avoidance Scale scores mediated changes in symptoms of depression (see Figure 17).

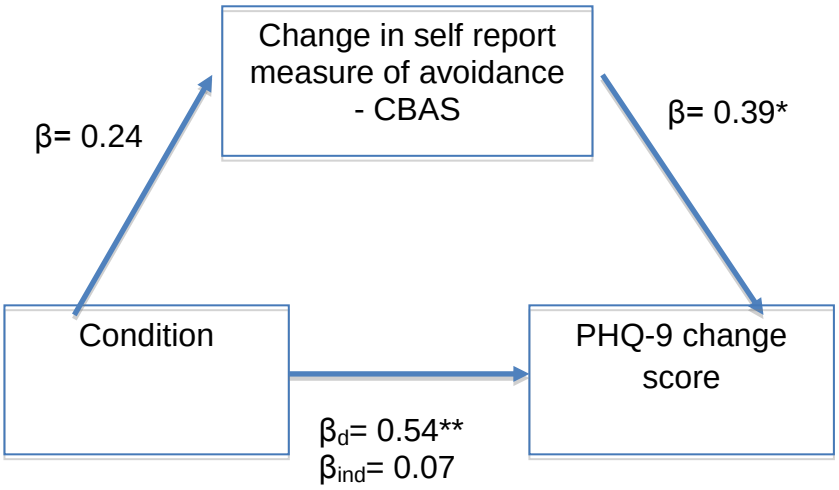


Figure 17. Mediation pathway for CBAS change scores

Notes on Figure 17.

** = significant at p<0.01 level, * = significant at p<0.05 level.

Standardised β coefficients reported.

There was a significant positive direct effect of condition on PHQ-9 change scores, β= 0.54, *p*<0.01. There was a significant positive direct effect of change on CBAS total score to change on PHQ-9 score, β= 0.39, *p*= 0.01. There was a significant indirect effect of CBAS score on change in PHQ-9 scores, β_{ind}= 0.07, 95% bootstrapped CI (0.003, 0.173). This represents a relatively small effect, κ^2 =0.07, 95% bootstrapped CI (0.014, 0.187)[3].

[3] Kappa squared used as a measure of effect size. Values closer to 1 represent a larger effect. (See Methods, section 3.6.2 Planned statistical analyses for more detail).

Mediation analysis using change in BADS scores

Mediation analysis was calculated to explore whether changes in Behavioural Activation and Depression Scale scores mediated changes in symptoms of depression (see Figure 18).

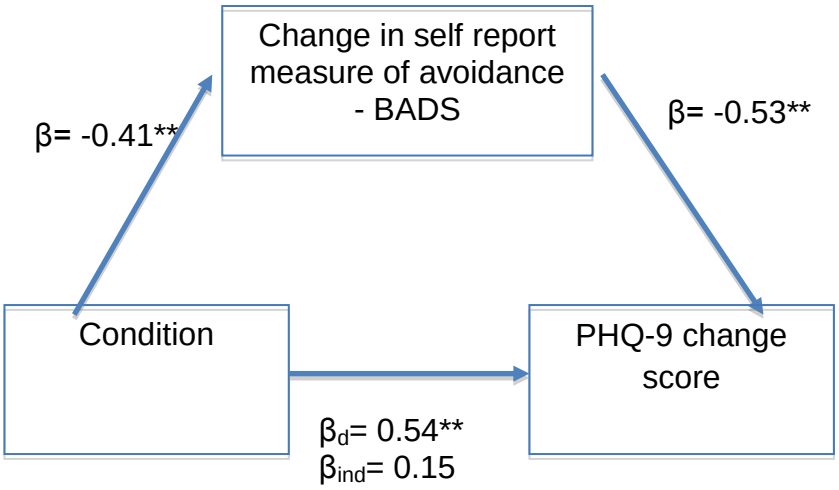


Figure 18. Mediation pathway for BADS change scores

Notes on Figure 18

** = significant at p<0.01 level, * = significant at p<0.05 level.

Standardised β coefficients reported.

There was a significant positive direct effect of condition on PHQ-9 change scores, β= 0.54, *p*<0.01. There was a significant negative direct effect of change in BADS score on PHQ-9 change in scores, β= -0.53, *p*= <0.01. There was a significant negative direct effect of condition on change in BADS scores, β= -0.41, *p*= <0.01. A significant indirect effect of change in BADS score PHQ-9 scores was found, β_{ind}= 0.15, 95% bootstrapped CI (0.005, 0.412). This represents a relatively small effect, κ^2 =0.17, 95% bootstrapped CI (0.015, 0.392).

Mediation analysis using change in RRS scores

Mediation analysis was calculated to explore whether changes in Ruminative Response Scale scores mediated changes in symptoms of depression (see Figure 19).

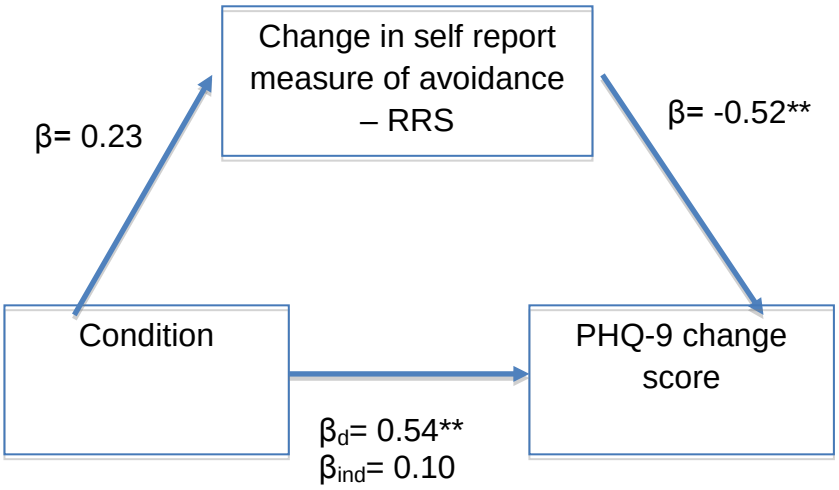


Figure 19. Mediation pathway for RRS change scores.

Notes on Figure 19.

** = significant at p<0.01 level, * = significant at p<0.05 level.

Standardised β coefficients reported.

There was a significant positive direct effect of condition on PHQ-9 change scores, β= 0.54, *p*<0.01. There was a significant positive effect of change in RRS score on change in PHQ-9 score, β= 0.52, *p*= <0.01. There was a non-significant indirect effect of change in RRS score on change in PHQ-9 score, β_{ind}= 0.10, *p*= <0.01, 95% bootstrapped CI (-0.223, 0.308).

4.5. Treatment compliance

Treatment compliance was measured using the behavioural checkout sheet which was returned to the researcher at Time 2. Participants were on average assigned 4.2 activities to complete over the 1-week treatment interval (*SD*=

0.93). Participants completed an average of 2.1 activities (*SD*= 1.21) over the treatment week interval.

A compliance score was calculated for each participant by dividing the number of activities completed by the number of set target activities. Participants reported undertaking an average of 51.4% (*SD*= 29.14) of the target activities they had agreed to.

4.5.1. Associations between change on self report measures and compliance to BATD during treatment interval

Exploratory correlational analyses were used to explore whether treatment compliance was related to PHQ-9, CBAS, RRS, AAQ and BADS change scores (see Table 8).

Table 8. Correlations between changes on self report measures and BATD compliance.

Measure (Time 2 minus Time 1 change)	Number of activities agreed at Time 1	Number of completed activities during treatment interval
Patient Health Questionnaire-9	-0.24	-0.28
Cognitive Behavioural Avoidance Scale†	-0.08	0.05
Acceptance and Action Questionnaire	-0.32	0.11
Ruminative Responses Scale†	-0.50*	-0.33
Behavioural Activation for Depression Scale†	0.57**	0.24

*= significant at 0.05 level, **=significant at 0.01 level

† Correlations computed using total scale scores

There was a significant negative correlation between number of agreed activities and RRS total scale change score, *r*= -0.50, *p*=0.02. This suggests that agreeing to more activities was associated with a decrease in RRS scores between Time 1 and Time 2, representing reduced rumination. There was a significant positive correlation between number of agreed activities and change in BADS total scale score between Times 1 and 2, *r*= 0.57, *p*=<0.01. This indicates that agreeing to more activities was associated with an increase in BADS score between Time 1 and Time 2, representing increased activation. There were no significant correlations between number of completed activities and change in self-report measures.

4.5.2. Associations between change on AAT effect scores and compliance to BATD during treatment interval

Exploratory correlational analyses were also conducted to explore possible associations between changes on AAT effect scores between Times 1 and 2 with BATD compliance during the treatment interval. No significant correlations were found.

4.6. Ancillary analyses

4.6.1. Correlations between change in symptoms of depression and baseline behavioural and self report measures of avoidance

Correlations were used to explore associations between baseline behavioural (AAT effect scores) and self report measures (CBAS, BADS, RRS and AAQ) of avoidance with changes in depressive symptoms (PHQ-9 score). No significant correlations were found.

4.6.2. Correlations between changes in self report measures and baseline AAT effect scores

Correlations were used to explore associations between baseline (Time 1) AAT effect scores for different valence stimuli and changes between Time 1 and 2 on the self-report measures (see Table 9).

Table 9. Correlations between Time 1 AAT effect scores and self-report measures change scores between Time 1 and 2.

Change score (Time 1 to 2)	Time 1 score (n=36)			
	Angry effect score	Happy effect score	Neutral effect score	Sad effect score
Patient Health Questionnaire-9	-0.13	0.22	0.10	0.04
Cognitive Behavioural Avoidance Scale†	-0.15	0.09	-0.18	-0.15
Acceptance and Action Questionnaire	-0.04	-0.24	-0.10	-0.42**
Ruminative Response Scale†	-0.19	-0.23	0.01	0.08
Behavioural Activation for Depression Scale†	-0.24	0.06	0.010	0.33*

*= significant at 0.05 level, **=significant at 0.01 level

† Correlations computed using total scale scores

There was a significant negative correlation between the effect score for sad faces and AAQ total score, *r*= -0.42, *p*=0.01. This suggests that faster avoidance to sad valence stimuli was associated with a decrease in AAQ scores between Time 1 and Time 2.

There was a significant positive correlation between effect score for sad faces and BADS total score, *r*=0.33, *p*= 0.05. This suggests that faster approach to sad valence stimuli was associated with increase in BADS scores activation between Time 1 and Time 2, representing increased activation.

4.6.3. Correlations between changes in behavioural and self report measures of avoidance

Correlations were used to explore associations between change in the behavioural measure of avoidance (AAT effect scores) and change in self-report measures of avoidance (CBAS, BADS, RRS and AAQ). No significant correlations were found.

4.6.4. One month follow up (Time 3) changes on PHQ-9, CBAS, AAQ, RRS and BADS between time points

Self-report measures at Time 3 were given to participants one month after Time 1 meeting (either via email or post). There was some attrition at follow-up, with only 32 responses received (Treatment condition n=16, Waiting list control n=16). Participants varied in the number of days it took to complete Time 3 measures: Treatment (*M*= 41.50, *SD*= 10.20) and Waiting list control (*M*= 36.19, *SD*= 11.62). An independent samples t-test found that the group differences in time taken to complete Time 3 questionnaires was not statistically significant, *t* (30) = 1.36, *p*=0.18. (See Table 10 for a summary of Time 3 scores on the different self-report measures for n=32 sample).

Table 10. Times 1, 2 and 3 PHQ-9, CBAS, AAQ, RRS and BADS scores (*n*=32).

	Time 1		Time 2		Time 3	
Measure	Treatment (n=16)	Control (n=16)	Treatment (n=16)	Control (n=16)	Treatment (n=16)	Control (n=16)
Patient Health Questionnaire-9	16.00 (5.03)	16.19 (4.10)	11.44 (5.67)	14.69 (4.59)	9.81 (4.32)	11.56 (5.20)
Cognitive Behavioural Avoidance Scale						
Behavioural social	24.94 (8.63)	21.69 (8.57)	22.88 (9.03)	21.19 (7.84)	20.50 (7.88)	21.00 (8.51)
Behavioural non-social	18.62 (4.40)	17.75 (4.37)	17.00 (5.05)	17.06 (4.01)	16.19 (4.43)	16.00 (5.40)
Cognitive social	21.12 (7.78)	18.63 (5.49)	18.50 (8.44)	17.81 (5.55)	17.19 (7.90)	17.13 (5.58)
Cognitive non-social	30.94 (9.53)	29.06 (8.98)	28.31 (9.75)	27.00 (8.50)	23.31 (7.45)	25.50 (8.50)
Total	106.12 (23.93)	98.56 (21.41)	97.31 (25.14)	94.38 (19.52)	90.25 (23.35)	90.94 (23.98)
Acceptance and Action Questionnaire	78.75 (8.53)	79.13 (13.32)	74.19 (9.49)	76.31 (12.24)	72.13 (11.46)	76.75 (10.52)
Ruminative Response Scale						
Depression	34.69 (6.68)	34.19 (5.08)	35.13 (9.94)	35.69 (5.53)	33.06 (7.911)	31.75 (7.50)
Reflection	11.63 (3.99)	11.81 (3.23)	11.81 (2.95)	11.69 (2.09)	10.30 (2.82)	11.06 (2.11)
Brooding	14.06 (3.51)	13.94 (3.02)	13.50 (3.65)	15.25 (2.70)	12.75 (3.26)	12.94 (3.55)
Total	60.37 (11.66)	59.94 (9.95)	60.44 (11.57)	62.63 (8.05)	56.13 (12.57)	55.75 (10.96)
Behavioural Activation for Depression Scale						
Activation	14.44 (9.10)	14.94 (8.44)	17.69 (7.40)	15.44 (7.55)	18.81 (4.89)	15.19 (6.06)
Avoidance/Rumination	25.94 (10.25)	29.56 (8.31)	21.44 (9.73)	26.56 (8.62)	27.19 (10.04)	24.38 (11.18)
Work/school impairment	14.69 (5.84)	15.31 (7.12)	10.88 (5.57)	15.50 (5.91)	18.25 (6.03)	17.19 (6.01)
Social impact	12.88 (8.18)	12.06 (6.83)	10.63 (8.19)	11.56 (7.19)	19.19 (9.22)	19.88 (6.01)
Total	68.94 (25.99)	66.00 (24.74)	82.75 (21.52)	69.81 (23.61)	83.44 (21.32)	76.63 (25.30)

Statistical analyses were used to explore any significant differences between the treatment and control group on the self-report measures across all three time points.

A repeated measures ANOVA was conducted to assess the impact of condition (treatment or control group) on participants' scores on the PHQ-9, across three time periods (Times 1, 2 and 3). There was a significant main effect of time, F (2, 60)= 26.08, p<0.01, partial η^2=0.47. There was a non-significant main effect of condition, F (1, 30)= 1.37, p=0.25 and non-significant interaction between condition and time, F (1, 60)= 2.08, p=0.14. Post hoc comparisons were completed for further exploration of the main effect of Time, using the Bonferroni method of adjustment for multiple comparisons *(*p=0.05/3, critical alpha level of p=0.02 used). Paired samples t-tests indicated significant differences between Times 1 and Time 2, t(39), 4.65, p<0.01; Times 1 and 3, t(39), 6.41, p<0.01 and Times 2 and 3, t(39), 2.87 p<0.01.

A series of repeated measures mixed design ANOVAs were performed using the self report measures (CBAS, RRS, AAQ and BADS) to investigate differences between groups (treatment and control) across time points (Times 1, 2 and 3). The within subjects factor was the total scale score for the self report measure and the between subjects factor was condition.

There were no significant main effects of condition. There were significant main effects of time for CBAS, F (2, 60) = 8.89, p=0.001; BADS, F (2, 60) = 9.81, p=0.00; RRS, F (2, 60) = 5.26, p=0.009 and AAQ, F (2, 60) = 8.09, p=0.001. There were no significant interactions between time and condition. Post hoc comparisons were completed using the Bonferroni method of adjustment for multiple comparisons to investigate differences across the three time-points (p=0.05/12, critical alpha level of p=0.004 used). Paired samples t-tests indicated significant differences between Time 1 and Time 3 CBAS scores, t(31), 3.57, p=0.001, AAQ scores, t(31), 3.39, p=0.002 and BADS scores, t(31), -3.39, p<0.001. There was a significant difference between Time 2 and Time 3 RRS scores, t(31), 3.03 p=0.002 and Time 1 and Time 2 AAQ scores, t(39), 3.20, p=0.003.

4.7. Summary of Results

4.7.1. Hypothesis 1

It was hypothesised that in comparison to control participants, participants in the treatment condition would show greater reductions in depressive symptoms, following one session of behavioural activation. The results of this study supported this hypothesis. There was a significant Condition by Time interaction, with the treatment group showing a significant decrease in PHQ9 scores over time, with significantly lower scores at Time 2. There was no significant change in depressive symptoms between Times 1 and 2 for the control group.

4.8.2. Hypothesis 2

It was hypothesised that compared to control participants, patients in the treatment condition would show significant increases in approach tendencies and reductions in avoidance tendencies of emotional faces, and greater improvements in avoidance and rumination on self report questionnaires, following behavioural activation treatment.

Analysis of separate valence factors indicated that there was a significant Condition by Time interaction for happy faces, indicating that behavioural response to happy faces changed between Times 1 and 2. Further exploration of the data using post hoc comparisons indicated that behavioural response to happy faces was close to significance for the treatment group, with non-significant differences for the control group. Analyses for the other valence stimuli were non-significant.

Analysis of changes in the self report measures indicated a significant Condition by Time interaction for BADS scores. Post hoc analysis indicated that there was a significant difference between Time 1 and Time 2 BADS scores for the treatment group but not the control group. Analyses for the other self report measures were non-significant.

4.8.3. Hypothesis 3

It was hypothesised that the degree of changes in approach and avoidance would mediate the impact of treatment condition and changes in symptoms of

depression. Correlations between changes in symptoms of depression and AAT effect scores were initially explored to examine the feasibility of further mediation analysis. A significant correlation was only found with happy valence stimuli, which warranted subsequent mediation analysis. There was no evidence of change in response to happy valence stimuli mediating change in depressive symptoms.

Correlations between changes in symptoms of depression and self report measures were used to explore to examine whether mediation analysis was indicated. Significant correlations were found between change in BADS, CBAS and RRS scores and PHQ-9. Mediation analyses showed evidence of small indirect effects of change in CBAS total scores and BADS total scores on change in PHQ-9 scores.

4.8.4 Additional Results

Supplementary analyses revealed some other interesting preliminary findings. Treatment compliance was relatively low, with participants completing an average of 51.4% of the target activities during the one week treatment interval. Correlations exploring associations between treatment compliance and changes in self report measures indicated that agreeing to more activities was associated was a decrease in RRS score and an increase in BADS score at Time 2, representing reduced rumination and increased activation respectively

Small correlations were found between strength of behavioural avoidance and approach tendencies at Time 1 for sad faces and change in AAQ and BADS scores between Time 1 and Time 2. Faster avoidance to sad valence stimuli was associated with a decrease in AAQ score between Times 1 and 2. In contrast faster approach to sad valence stimuli was associated with an increase in BADS scores.

Strong associations were found between changes on the PHQ-9 and other self-report measures of avoidance. Greater reductions on the PHQ-9 were associated with greater reductions in rumination (RRS) and avoidance (BADS) between Time 1 and Time 2.

There were no significant differences between the treatment and control condition when Time 3 data was explored, although there were significant improvements between the three time points for the self-report measures (CBAS, AAQ, BADS and RRS).

5. Discussion

This is the first study to investigate the impact of one-session behavioural activation treatment on depressed participants in a clinical setting and to explore mechanisms of change. Participants were randomised to either treatment or waiting list control condition. Changes in depressive symptoms, self reported avoidance and behavioural approach and avoidance tendencies were taken at pre intervention (Time 1), post intervention (Time 2) and at one month follow up (Time 3).

In this chapter the findings are described in relation to the study hypotheses and the current literature. The chapter then focuses on the clinical and theoretical implications of the findings, with future research pathways identified as well as the strengths and limitations of the current study.

5.1. Hypotheses revisited - Summary of findings in relation to current literature

5.1.1. Hypothesis 1

Hypothesis 1 postulated that in comparison to control participants, participants in the treatment condition would show greater changes in depressive symptomatology after receiving one treatment session. This hypothesis was confirmed, as there were significant decreases in PHQ-9 scores for participants in the treatment condition between Times 1 and 2. There were no significant changes in depressive symptoms for participants in the control condition between Time 1 and Time 2.

There has been accumulating evidence demonstrating the efficacy of behavioural activation treatments for depression, with studies finding behavioural activation comparable to cognitive therapy for depression (Cuijpers et al., 2007; Dobson et al., 2007; Dimidjian et al., 2006; Jacobson et al., 1996; Mazzucchelli et al., 2009). In contrast there has been limited research exploring the efficacy of a single session of behavioural activation treatment on depressive symptoms. Gawrysiak et al (2009) utilised a single structured session of BATD to investigate the impact of treatment for a sample of college students with moderate depressive symptoms. Gawrysiak et al.'s results

showed that participants in the treatment condition showed significantly larger reductions in depressive symptoms post treatment.

Whilst Gawrysiak et al.'s results were promising in demonstrating the effectiveness of a single session of BATD, further research using a clinical sample was indicated. The current study has employed a similar research design, with promising results. After receiving one session of BATD, participants in the treatment condition showed significant decreases in depressive symptoms. There was no significant change in depressive symptoms for participants in the control condition. These results provide strong support for the efficacy of a single session of BATD in attenuating symptoms of depression, building on Gawrysiak et al.'s work using a clinical sample of depressed individuals from a primary care psychological therapies service. The changes in depressive symptoms for the treatment group occurred in the context of participants completing only 50% of assigned tasks. This suggests that with better compliance even better results in terms of depressive symptomatology may be achievable.

5.1.2. Hypothesis 2

Hypothesis 2 posited that participants in the treatment condition would show significant increases in behavioural approach tendencies and reductions in behavioural avoidance tendencies of emotional faces, and reductions in avoidance on self-report questionnaires.

5.1.2.1. Self report measures of avoidance

Separate analyses were conducted using the four self-report measures of avoidance – CBAS, AAQ, BADS and RRS. Hypothesis 2 was partially confirmed, as there was a significant Condition by Time interaction for BADS scores. Post hoc comparisons indicated that there was a significant difference between Time 1 and Time 2 BADS scores for the treatment group. The direction of the change in the treatment group indicated that increased activation occurred after receiving the behavioural activation treatment. Analysis of the other self-report measures did not yield any other significant results. This finding is line with reductions in PHQ-9 scores post treatment, as decreased

depressive symptoms are likely to be associated with increased activation following behavioural activation intervention.

5.1.2.2. Behavioural measure of avoidance

For the behavioural measure, separate analyses were computed for each valence. The hypothesis was again partially confirmed, as there was a significant interaction between Condition and Time for responses to happy faces. Post hoc comparisons indicated that this difference was non significant for the control group however there was a non- significant trend for the treatment group; this would have been significant if there had not been a Bonferroni correction for multiple comparisons. The pattern of these results was in the expected direction, with increased approach behaviours towards positive valence stimuli (happy faces) following behavioural activation treatment, although the effects failed to reach significance. This indicates that the 'dosage' of the intervention may not have been strong enough, as participants only completed 50% of target activities during the treatment interval, after receiving minimal intervention (one session only). Despite this, the pattern of results that emerged would merit further investigation in another study to explore whether more intensive therapeutic input would lead to larger changes in approach avoidance behaviours.

The AAT is a relatively new measure, initially conceptualised by Rinck and Becker (2007) to assess behavioural approach avoidance reactions in anxiety disorders (e.g. Heuer, Rinck & Becker, 2007; Lange, Keijsers, Rinck & Becker, 2008; Lange, Salemink, Windey, Keijsers, Krans, Becker et al, 2010; Roelofs, Putman, Schouten, Lange, Volman & Rinck, 2010). Although Vrijsen et al (2012) recently utilised the AAT to explore approach and avoidance behaviours towards emotional facial expressions after being induced to either to sad or happy mood, this is the first study to use the AAT with a clinical sample of depressed individuals to explore behavioural approach and avoidance tendencies. As a result there is a paucity of research to which the results of this study can be compared to; comparisons between studies are likely to occur as further research is completed in this area.

Despite a lack of studies previously exploring behavioural approach avoidance tendencies in depression using an experimental measure, there has been research investigating the processing of emotional faces in depression. A well-documented association between depression and recognition of emotional faces exists in the literature (e.g. Cooley & Nowicki, 1989; Wexler, Levenson, Warrenberg & Price, 1994), in particular when identifying happy facial expressions (Jaeger, Borod & Peselow, 1987; Joorman & Gotlib, 2006). One of the key premises underpinning the AAT is that positive stimuli will elicit approach behaviours and negative stimuli will elicit avoidance (Cacioppo et al., 1993; Chen & Bargh, 1999). Therefore it is promising that behavioural activation treatment can lead to changes in response to happy valence stimuli. Whilst the findings should be considered tentatively, evidence of a non-significant trend for the treatment group towards reduced behavioural avoidance post treatment, does suggest that despite participants initially responding in keeping with a negative bias characteristic of depression, behavioural activation treatment can lead to positive changes. This suggests that behavioural activation may help to counteract one of the negative biases in depression.

5.1.3. Hypothesis 3

Hypothesis 3 postulated that the degree of changes in approach and avoidance would mediate the impact of treatment condition on changes in depressive symptoms.

This is one of the first studies to provide evidence of a possible mechanism of change within behavioural activation treatments. The results of this study demonstrate that behavioural activation treatment, as short as one week, can lead to changes in depressive symptoms, increases in activation and reductions in self-reported avoidance. As these were relatively small effects, with only partial mediation, this suggests that there are likely to be additional mechanisms at play.

Meditational analyses were used to investigate whether changes in PHQ-9 scores were mediated by changes in behavioural (AAT scores) or self-report measures of avoidance (CBAS, BADS, RRS and AAQ). Results showed small but significant indirect effects of change in CBAS scores and BADS scores on

depressive symptoms. This is consistent with the hypothesis that changes in approach / avoidance, as assessed by these measures, partially mediated the impact of condition (treatment or control) on change in depressive symptoms (PHQ-9 score). As the measures of approach / avoidance were taken at the same time as the changes in depressive symptoms, firm conclusions cannot be drawn about the causal direction; i.e. it is possible that changes in depressive symptoms led to reductions in avoidance. A complex, dynamic and reciprocal interaction between behavioural and other features of depression is likely be occurring.

Investigating mechanisms of change with regards to behavioural activation is in an area very much in its infancy. The current literature supports the idea of approach avoidance behaviours being central to change in behavioural activation (e.g. Martell et al., 2004). The results of the current study add to the emerging body of evidence that behavioural activation approaches do work at least partly through addressing approach / avoidance behaviours.

5.1.4. Additional findings

Further analysis of the data was completed in order to highlight any other findings of note, with supplementary analyses revealing some several interesting results.

5.1.4.1. Treatment compliance

Treatment compliance was assessed as a way of quantifying the amount of activation that took place during the one-week treatment interval. Participants, on average, engaged in 51.4% of agreed activities. This approximated to completing around two activities, when three to five target activities were agreed with participants. Compared to previous studies of behavioural activation treatment, this represents relatively low treatment compliance, with other studies reporting between 70% and 82% compliance (Gawrysiak et al., 2009; Hopko et al., 2005, 2008). It is possible that increasing therapeutic input would have led to increases in treatment compliance,

Correlations were used to explore associations between treatment compliance (both agreement of activities to be completed during the treatment interval and

number of activities actually completed during the treatment interval). These correlations revealed that agreeing to more activities, rather than completing more activities, was linked to greater changes in rumination and activation, in the direction of decreased rumination and increased activation between Times 1 and 2. This is contradictory to the principles of behavioural activation, which posit that it is the actual engagement in positively reinforcing activities which ameliorate symptoms of depression. This implies that the hope associated with agreeing to more activities is more strongly linked to changes in rumination and activation, rather than actually engaging in the activity itself. This suggests that there may be other mechanisms at play, warranting further investigation, as only tentative conclusions can be drawn from this study due to relatively low level of treatment compliance.

5.1.4.2.One month follow up data

Statistical analyses were used to explore differences at Time 3 (one month follow up). There were no significant main effects of condition. Analysis of the PHQ-9 data revealed a significant main effect of time. Post hoc comparisons indicated differences between all time points i.e. between Times 1 and 2, Times 2 and 3 and Times 1 and 3. Analysis of the self-report measures of avoidance revealed significant main effects of time for all four measures (CBAS, RRS, AAQ and BADS). Post hoc comparisons indicated differences across Times 1 and 3 for the CBAS, AAQ and BADS scores; difference between Times 1 and 3 RRS score and differences across Times 1 and 2 AAQ score.

The lack of group differences at follow up (Time 3) raises some questions, as significant group differences were found at Time 2. One possibility relates to the length of intervention itself. A single 90-minute session of behavioural activation was sufficient to lead to reductions in depressive symptoms after one week of treatment interval. However it is possible that whilst brief behavioural activation can minimise symptoms of depression in the short term, these gains may not hold over an extended period of time without the benefit of potential booster sessions. The absence of significant group differences at follow up may be indicative of the lack of possible long term effects of a single session of behavioural activation.

Following the Time 2 session, some participants expressed an interest in continuing to implement behavioural activation in their lives. Requests for further behavioural checkout sheets were made so participants could continue to incorporate activities in line with their values into their lives whilst waiting for treatment from the primary care psychology service. Unfortunately, this information was not quantified at Time 3 so it was not possible to explore whether an association exists between continued implementation of behavioural activation principles and symptoms of depression at follow up, in the absence of contact with a therapist.

Lack of group differences at Time 3 may have been affected by the comparatively low treatment compliance (see Section 5.1.4.1. above). Higher treatment compliance may have helped to maintain reduced depressive symptoms and self reported avoidance.

5.1.4.3. Correlations between changes in self report measures of avoidance and baseline behavioural measure of avoidance

Correlations exploring associations between Time 1 AAT effect scores and changes in self-report measures of avoidance (between Time 1 and Time 2) revealed some interesting findings in relation to sad valence stimuli. Faster avoidance to sad faces at Time 1 was associated to decreases in AAQ scores during the treatment interval. In contrast, faster approach to sad valence stimuli was linked to increases in activation (BADS score) during the treatment interval.

5.2. Strengths and limitations

Strengths of this study include the randomised design in which one group received the intervention and the other group received no intervention. A further strength of this study was the use of a behavioural measure of approach avoidance behaviours (AAT) in addition to self-report questionnaires. The numerous disadvantages associated with relying solely on self-report measures have been well documented in the literature (e.g. Cronbach, 1970; Fiske, 1980). These include individuals being prone to demand characteristics and/or social desirability. A behavioural measure was included to help overcome the criticisms associated with self-report measures.

Whilst the results of this study adds to the limited body of research investigating the role of approach and avoidance in relation to depression, there are several limitations which suggest caution should be used when interpreting findings.

5.2.1. Sequence of variables in proposed mediational models

A temporal sequence mediational model was used in this study, with measurements of all variables in the proposed mediation models (predictor variable = condition, dependent variable = PHQ-9 change, mediator = change in behavioural or self report measure of avoidance) taken at the same time points i.e. AAT and self report measures all completed at Time 1 or all completed at Time 2. Measurement of all variables in the mediation models at the same time presents difficulties in establishing temporal precedence, due to a lack of evidence of a causal relationship. This means that firm conclusions cannot be made regarding whether changes in approach avoidance mediated changes in depressive symptoms, indeed it could be the other way round. Future studies should utilise a time lag design, whereby measures of approach and avoidance are taken prior to measures of depressive sequences e.g. at a mid point between completing pre and post treatment outcome measures. This would help to establish temporal precedence, as the hypothesised cause (change in approach avoidance behaviour) would occur before the hypothesised outcome (change in depressive symptoms).

5.2.2. Use of self report measures of avoidance

It could be argued that one limitation of the current study is in relation to the self-report measures used. Two of the self-report measures of avoidance (CBAS and BADS) have not been fully validated in clinical samples, whilst there is some debate by researchers regarding the use of the AAQ.

CBAS

The CBAS self-report measure was developed relatively recently, partly to address inconsistencies in the definition of avoidance which had led to difficulties in comparisons across studies (Ottenbriet & Dobson, 2004). As a multidimensional self-report measure of avoidance, the CBAS has been utilised since its inception to explore associations between depression and avoidance (e.g. Cribbs et al., 2006; Wong & Moulds, 2011). However, these studies have

been generally restricted to nonclinical samples of undergraduate students, with little evidence regarding the use of the CBAS with a clinical sample. A recent study by Ottenbriet, Dobson and Quiqley (2014) was the first to use CBAS with a sample of clinically depressed individuals. The current study, in which change in CBAS scores was a mediator of the impact of the treatment, adds to this literature, advocating and highlighting the utility of the CBAS with clinical samples. A possible key use of the CBAS in future studies may involve capturing changes in avoidance after behavioural activation treatment. Although there was a significant reduction on the CBAS over time, there was no significant difference between the two groups on this measure, unlike the BADS. Therefore further research is needed, for example to investigate whether more intensive behavioural activation interventions would result in changes in avoidance, as measured by the CBAS.

BADS

Like the CBAS, the BADS (Kanter et al., 2006) has been recently developed, thus there has been limited research using the measure, with even fewer treatment studies utilising it. Although Kanter et al. (2007) initially developed the BADS specifically for use with the Behavioural Activation protocol (Martell et al., 2002), they have suggested that it can also be used with the BATD protocol. However the BADS has not been widely used with the BATD protocol.

The finding in the present study that participants in the treatment condition showed a significantly greater increase in BADS scores than those in the control condition supports the use of this measure with the BATD treatment protocol. Future research studies using the BATD protocol should not shy away from using this measure despite being designed with the Behavioural Activation treatment in mind, as suggested by Kanter et al. (2007). However, the use of the shorter 9-item version of the BADS (Manos, Kanter & Luo, 2011) should be considered, particularly when other measures are being used and in the face of time constraints.

AAQ

Despite being designed and used as a measure of experiential avoidance and psychological inflexibility, there has been controversy regarding the AAQ.

Disadvantages cited include the complexity of some items e.g. “I rarely worry about getting my anxieties, worries and feelings under control” which is close to becoming a double negative statement or items which are difficult to comprehend and make sense of e.g. “When I evaluate something negatively, I usually recognise that this is just a reaction, not an objective fact”. Another common criticism relates to the internal consistency, which has been as low as α = 0.64 (Hayes et al., 2004), thus only just reaching the ‘satisfactory’ benchmark. Caution has been advised when using the AAQ as a process measure of experiential avoidance in clinical trials, as it may not be sensitive to change (Hayes et al., 2004).

Future studies may benefit from using the Acceptance and Action Questionnaire II (AAQ-II; Bond et al., 2011), which is a shorter 9-item measure. The AAQ-II has better internal consistency than the original AAQ, as low correlated items were deleted to create a revised and more unidimensional measure.

5.2.3. Experimental measure of behavioural approach and avoidance tendencies

The results of the AAT analysis did not indicate as many effects as expected, with a significant Condition by Time interaction for happy valence stimuli only. Limitations associated with using the AAT may account for the reduced effects found.

Whilst there is a well researched bias in depression regarding the processing of emotional faces (e.g. Wexler et al., 1994) there has been some debate about whether this bias in facial expressions is associated to a deficit in perception of emotional facial expressions (e.g. Surguladze et al., 2004) or labelling of emotional facial expressions (e.g. Feinberg, Rifkin, Schaffer & Walker, 1986). In this study, participants were simply asked to behaviourally respond to each stimuli using either a push or pull arm movement. Participants were not asked about their perception or labelling of each emotional facial expression. As this was not specifically addressed, it is possible that a perceptual deficit or deficit in labelling may have impacted on an individual’s behavioural response, and one session of behavioural activation may not have been sufficient for change to occur in these deficits.

Joorman and Gotlib (2006) suggested that one reason for individuals with depression struggling to correctly identify happy facial expressions may relate to their level of confidence. So individuals may perceive the happy facial expression as early as non-depressed participants but delay their response until they feel more confident in their accuracy. Again, this presents a plausible explanation for the lack of observed effects in the AAT. Participants response on the AAT may well have been affected by their confidence in completing the task i.e. some participants were more familiar with computers and gaming equipment (joystick), possibly contributing to increased feelings of confidence. Unfamiliarity with computers and such equipment may well have led to participants experiencing a lack of confidence when completing the task. The level of confidence may well have mediated behavioural responses, with a lack of confidence leading to longer response times. It is possible that despite experiencing a decrease in depressive symptoms, participants who were initially lacking confidence in completing the AAT remained apprehensive and unconfident about their abilities at Time 2.

Another possible reason for the lack of observed effects relates to the sensitivity of the AAT. The AAT has previously been used in samples of individuals with anxiety disorders (e.g. Heuer et al., 2007), spider phobias (e.g. Klein et al., 2007) and addictions (e.g. Wiers et al., 2010). The AAT has not been used in a treatment study to date, or even a sample of clinically depressed individuals. Whilst the AAT can measure behavioural approach avoidance tendencies it may lack the sensitivity for use in a treatment study, particularly when there is a short time lag between the pre and post stages. Changes in self-report measures of avoidance were found between time points. It is conceivable that changes occur at the attitude level before occurring at the behavioural level, with one-week treatment interval not adequate for changes at the behavioural level to occur.

A key criticism of the use of joysticks in approach avoidance tasks is the ambiguity of arm movements (e.g. Kriegelmeyer & Deutsch, 2010; Stins et al., 2010). Researchers have highlighted that pushing a joystick can signify either pushing away from the body (representing avoidance) or reaching out to grab something on the screen (representing approach). This lack of certainty may

increase the likelihood of error variance. In order to overcome this ambiguity the AAT employs a ‘zooming effect’ to create a visual impression of the stimuli either approaching or moving away from the individual depending on the joystick movement. Despite the use of this visual feedback, Kriegelmeyer and Deutsch (2010) argue that using a manikin task paradigm is superior to a joystick task. In a joystick task they argue that participants move stimuli on the screen whilst in a manikin task participants are required to move a figure on screen toward or away from the stimuli, which is more representative of individual movement. Kriegelmeyer and Deutsch (2010) describe this as being a more valid way of measuring automatic approach avoidance rather than the manipulation of stimuli on screen. It is possible that the AAT did not sufficiently activate approach avoidance tendencies in depressed individuals. Future studies may benefit from comparing measurement of approach avoidance tendencies using joystick and manikin tasks.

5.2.4. Measuring reinforcement

Participants were asked to complete a behavioural checkout sheet during the one-week treatment interval, however this was not always completed. Key to behavioural activation treatments is the idea of individuals ‘activating’ themselves, that is to say individuals begin to engage in activities which bring about a sense of pleasure and/or achievement. As this premise was central to the development of target activities, a measure of activation (BADS) was utilised. However there are some difficulties associated with the use of this measure.

The BADS was designed for use as a weekly measure throughout the duration of treatment. It focuses on measuring the frequency of activation, escape and avoidance behaviours. However there is little focus on assessing reinforcement or subsequent mood resulting from engaging in such behaviours. Some items come close to including mood components e.g. “I am content with the amount and type of things that I did” but do not explicitly explore mood occurring in response to behaviour. This presents difficulties in drawing firm conclusions about an individual’s sense of pleasure and/or achievement from engaging in a specific activity.

A useful addition may well include the Environmental Reward Observation Scale (EROS; Armento & Hopko, 2007). Alternatively, Manos, Kanter and Busch (2010) have suggested that simultaneous use of both BADS and EROS would provide a measurement of functionally defined behaviour and contact with environmental reinforcement respectively.

The EROS, BADS and CBAS have all been hypothesised as tapping into the processes of change implicated in behavioural activation treatment (Mazzucchelli et al., 2009). Whilst the BADS was designed to measure activation at a behavioural level, the EROS aims to measure activation from a reinforcement perspective. The EROS was designed to improve earlier measures of response contingent positive reinforcement (e.g. Pleasant Events Schedule; PES, MacPhillamy & Lewinsohn, 1974; MacPhillamy & Lewinsohn, 1982). As a short, 10-item questionnaire, the EROS measures response contingent positive reinforcement over an extended period of time. Example items include “The activities I engage in usually have positive consequences” and “A lot of activities in my life are pleasurable”. It is based on the idea that general contact with reinforcement can be used as a measure of overall satisfaction and pleasure over time, which are specifically targeted during behavioural activation treatments. As a relatively new measure, there is limited research evidence for the EROS. Evidence has started to emerge indicating that scores on the EROS are significantly correlated to changes in depressive symptomatology following behavioural activation (e.g. Daughters et al., 2008; Gawrysiak et al., 2009).

5.2.5. Sample size

Although the sample was sufficiently large enough with adequate power to detect any significant effects, the sample size was small. This study would benefit from replication using a larger sample, enhancing the possibility of detecting associations and differences whilst reducing the possibility of Type II error. Despite the small sample size, meditational analysis was conducted. However it has been recommended that meditational analysis is best completed with fairly large sample sizes (e.g. Baron & Kenny, 1986; Gaynor & Harris, 2008).

5.2.6 Sample characteristics

All participants were screened for, and met diagnostic criteria for Major Depressive Disorder, with patients varying in their level of depressive symptomatology. This heterogeneous sample of participants is likely to be a fairly representative sample of individuals seeking psychological help at a primary care service. However, whilst efforts were made to maximise external validity, it is important to consider whether participants in this study were differentially motivated to those who declined to participate in the study. Contact for research studies was gained at point of service entry, with individuals asked during initial assessments at the primary care psychological therapy service. Participants who were invited to participate in the study were not asked about motivation for participating. It is possible that there were some differences in motivation, which may have confounded the study results. Some participants may have engaged in the study for the financial remuneration, whilst others may have participated as a way of seeking treatment earlier than they would receive in the primary care psychology service.

Previous research has highlighted the role of co-morbidity within depression with anxiety, substance use disorders and personality difficulties (e.g. Middeldorp, Cath, Van Dyck & Booomsma, 2005; Kessler et al., 2004; Rossi et al., 2001). In particular, a high degree of co-morbidity (between 50% and 75%) has been found with anxiety disorders (Kessler et al., 1996; Olfson et al., 1997). Although the screening process excluded any individuals with personality disorder diagnoses and substance misuse difficulties, a measure of anxiety was not incorporated into the study. This presents difficulties in disentangling the possible impact of anxiety on treatment, with results possibly confounded by any co-morbid anxiety. Another issue is that participants' answers to the screening questions were not cross-referenced with any other medical records. If participants omitted any information about comorbid symptoms or other issues during this stage, this could have impacted on the study results.

5.2.7. Therapist issues

One therapist completed all treatment sessions with participants so caution is advised when interpreting the results of this study. Replication is needed of

further one-session behavioural activation treatment studies using several therapists to validate the use of a single session treatment.

Behavioural activation sessions were not recorded; therefore adherence to the BATD protocol could not be assessed. Adherence to the treatment may have affected the level of treatment compliance in this study.

5.3. Theoretical implications

Approach and avoidance processes have been cited as a possible active ingredient of behavioural activation treatment by many researchers (e.g. Martell et al., 2004). The small but significant effects within the meditational analyses support this suggestion and indicate that this proposed mechanism of change warrants further scrutiny. From a theoretical perspective, there are several holes within the literature, which need to be addressed. Little is known about when changes in approach and avoidance tendencies occur during treatment, what type and nature of behavioural activation is most strongly associated with the reduction of depressive symptoms and how much treatment compliance is needed before changes become meaningful at a behavioural level. Some of these questions are beginning to be answered within the literature and are described further below.

Questions are raised about the suitability of one treatment session in exploring approach avoidance as mechanisms of change. There was a significant group difference at post-treatment on the BADS but not the CBAS. For the AAT, a difference in behavioural approach / avoidance was found only within responses to happy faces. This was borderline significant with the treatment group and non significant with the control group. Therefore it might be more appropriate to use more intensive interventions to investigate mechanisms of change. National guidelines for depression recommend that behavioural activation treatment should consist of 16 to 20 sessions over a period of three to four months (NICE, 2009). This study used a significantly shorter treatment protocol, which may have been sufficient for changes in depressive symptoms, but perhaps further consolidation of behavioural activation principles into participants' lives was needed before differences could be observed in behavioural approach and avoidance tendencies. A longer treatment would also make it more feasible for

changes in behaviour to be more assessed mid-way through treatment so that a more robust design for analysing mediation could be utilised.

Since the efficacy of behavioural activation has been demonstrated, studies have sought to explore factors contributing to positive change. One identified factor has been homework completion, with greater homework completion associated with more positive outcomes (Busch, Uebelacker, Kalibatseva & Miller, 2010). Treatment compliance, equivalent to homework completion[4] within this study was relatively low, with participants completing an average of 51.4% activities during the one-week treatment interval. This may help to explain why the group difference in depressive symptoms at one-week was not maintained at one-month follow-up. Previous studies have reported between 70% and 82% compliance (Gawrysiak et al., 2009; Hopko et al., 2005, 2008). If the effectiveness of treatment was reduced then it is feasible that this may have diluted changes in approach and avoidance behaviour. A question then emerges about whether higher treatment compliance, or treatment compliance at least comparable to previous studies, would affect the observed behavioural approach and avoidance tendencies.

Despite being an integral component of behavioural activation treatments the impact of different types of activities has attracted scant research. Previous studies have indicated that certain types of activities are associated with changes in mood. This includes engaging in pleasant activities (e.g. Lewinsohn & Graf, 1973) and functional activities (e.g. Posmontier). However, research has not focused on the differential impact of these activity types on mood. Do certain types of activities have more or less impact on depressive symptoms, approach and avoidance tendencies? Hershenberg, Paulson, Gros and Acierno (2014) explored the effect of type and amount of activities completed during behavioural activation. A sample of older adults with symptoms of depression and complicated bereavement completed five weeks of treatment. The results indicated that the number and nature of activities (pleasurable, functional or social) participants engaged in was not significantly related to change in

[4] Treatment compliance refers to the percentage of completed activities as a proportion of the number of agreed activities completed by the individual. This is comparable to homework completion which refers to number of completed homework activities.

depressive symptoms. Hersenberg et al. (2014) results have highlighted an important area warranting further research, particularly as their findings have limited generalisability due to the sample population (older adults). Replication of the study in relation to avoidance and approach behaviours using a working age adult population would certainly add to the literature.

5.4. Clinical implications

This study was the first efficacy study of a single session of behavioural activation using a modified version of BATD protocol (Hopko & Lejuez, 2007; Lejuez, Hopko & Hopko, 2011) with a clinical sample recruited from primary care psychology services. Although only preliminary, this evidence of clinical change in one session suggests that there should be consideration of the extension of the utility and applicability of behavioural activation treatment within the stepped care service model specified in Improving Access to Psychological Therapies Services (IAPT). Currently behavioural activation is situated within 'Step 3' of the model, with 16 to 20 sessions recommended (NICE, 2009).

Single session psychological interventions gained prominence in the 1980s and 1990s as a way of preventing psychological difficulties after experiencing traumatic events (e.g. Bordow & Porditt, 1979; Lavender & Walkinshaw, 1998). In a recent review Hymen, Stalker and Cait (2013) argued that single session interventions were not as effective as initially thought, advocating the use of a stepped care model, similar to IAPT. However, the results of other studies provide an alternative view. Denner and Reeves (1997) used a single session of assessment and therapy in a Community Mental Health Team with promising results. Two therapists met with each patient, and completed an in-depth assessment. Formulations from a CBT perspective were key, with a focus on providing patients with recommendations that they could go away and implement in their lives. Although the sample size was small (n=32) the results indicated that patients were 'fairly satisfied' and 'very satisfied' with the service. This suggests that further study of the efficacy of single session psychological interventions like behavioural activation would certainly be warranted. Single session interventions may be an alternative first step for those patients who are unable to commit to regular, weekly appointments or as a way of managing lengthy waiting lists. Patients could receive a session of behavioural activation

to help reduce depressive symptoms if there is a long waiting time for on-going therapy. Further research would be needed to investigate treatment efficacy according to severity of symptoms and for patients on waiting lists for treatment.

The results of this study suggest that some changes in approach and avoidance tendencies do begin to emerge after one session of behavioural activation and that these may be partial mediators of the treatment effect. This has clear implications for the focus of behavioural activation treatments, with more information needed about the type of activities that individuals need to engage in to result in maximum change. Further investigation using a longer treatment may facilitate understanding about the trajectory of change in approach and avoidance behaviours. Using dismantling studies would help pinpoint which treatment components are most necessary and effective in increasing activation and reducing avoidance thereby leading to reduced depressive symptoms.

5.5. Future directions for research

As discussed above, future research should consider using more intensive treatment interventions in the study of mechanisms of change in behavioural activation interventions, and investigate the nature and frequencies of activities most strongly associated with reductions in depression. Further possible research directions are outlined below.

5.5.1. Measuring behavioural activation – use of modern technology

Measuring activity level during the treatment interval using the behavioural checkout sheet presented difficulties for some individuals. Typical responses to overlooking the completion of this included not having enough time, forgetting about it or losing the sheet. Modern hand held technology may have a useful role to play here. Studies have started to emerge examining the effects of Internet-delivered and smartphone delivered therapy with promising results (e.g. Andersson, 2009; Boschen & Casey, 2008; Hoa Ly et al., 2014).

Individuals are increasingly reliant on technology during their daily life. Technology such as smart phone applications would allow for an ecologically valid measure of activity level and provide a snapshot of an individual's mood immediately before and after engaging in an activity. This would enable

exploration of associations such as type of activity and frequency of activity with mood. Technology could be used to feedback results to the clinician. In therapy sessions clinicians could present an individual with concrete examples of engaging in an activity and their corresponding mood. This could be a useful addition to therapy, in particular for those patients who struggle to recall and reflect on how engaging in a particular activity led to changes in mood and behaviour. Over time, it could be utilised as an outcome measure, and highlight changes over the course of therapy, and as a source of positive reinforcement for the individual. The use of application technology would mean that patients would no longer need to rely on their memory to fill in something, rather the data could be collected as and when activities occurred.

5.5.2. The role of motivation

Treatment compliance was relatively low within this study (51.2%). One possible reason for this relates to the motivation levels of participants. Motivational problems are a key symptom of depression. Motivation was not operationalised during this study, and may have mediated the effect of behavioural activation on depressive symptoms, and even approach avoidance behaviours. As work outside of the therapy room is key in behavioural activation, some ability to take action despite motivational difficulties is required. Whilst the treatment protocol aims to encourage the individual to make changes, the duration of the session (up to 90 minutes) leaves limited time for building the individual's level of motivation or willingness to increase behaviour despite motivational difficulties. Future studies utilising a one session design may choose to explore whether screening for motivational issues may help to identify individuals who would be the most likely to be able to benefit from such a brief intervention.

5.5.3. Use of behavioural measure of approach avoidance tendencies

The results of this study found differences in only happy valence stimuli following behavioural activation treatment; possible reasons for this have been discussed earlier. Future research would benefit from exploring these potential reasons to elucidate the feasibility and appropriateness of using the AAT as a behavioural measure of capturing changes in approach avoidance.

The addition of confidence ratings before and after completing the AAT would help to control for whether confidence in self/ability on task mediates performance on the task itself. Comparison of manikin and joystick tasks would highlight which task is most appropriate to use when measuring approach avoidance tendencies in clinical samples of individuals with depression.

5.6. Conclusions

This is the first study to report evidence of a reduction in depressive symptomatology in depressed participants after receiving one-session behavioural activation treatment compared to a no-intervention control group. Decreases in avoidance and increases in approach behaviour may partially mediate this effect, providing preliminary support for the theoretical underpinnings of the behavioural treatment. An important strength of this study was the use of a behavioural measure of approach / avoidance tendencies in addition to self-report measures. Replication is now required using a time lag design to establish whether a causal relationship between changes in depressive symptoms and approach avoidance behaviour exists, with behavioural change measured at a time-point prior to the key clinical outcome assessment.

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Appendices

Appendix A – National guidelines for depression and other recommended treatments

National guidelines for treatment of depression

The National Institute for Health and Clinical Excellence (NICE) has developed guidelines for the treatment of depression, offering best practice advice for clinicians and services. The NICE guidelines advocate the use of a stepped care approach to help achieve cost effectiveness (see Figure 19 below).

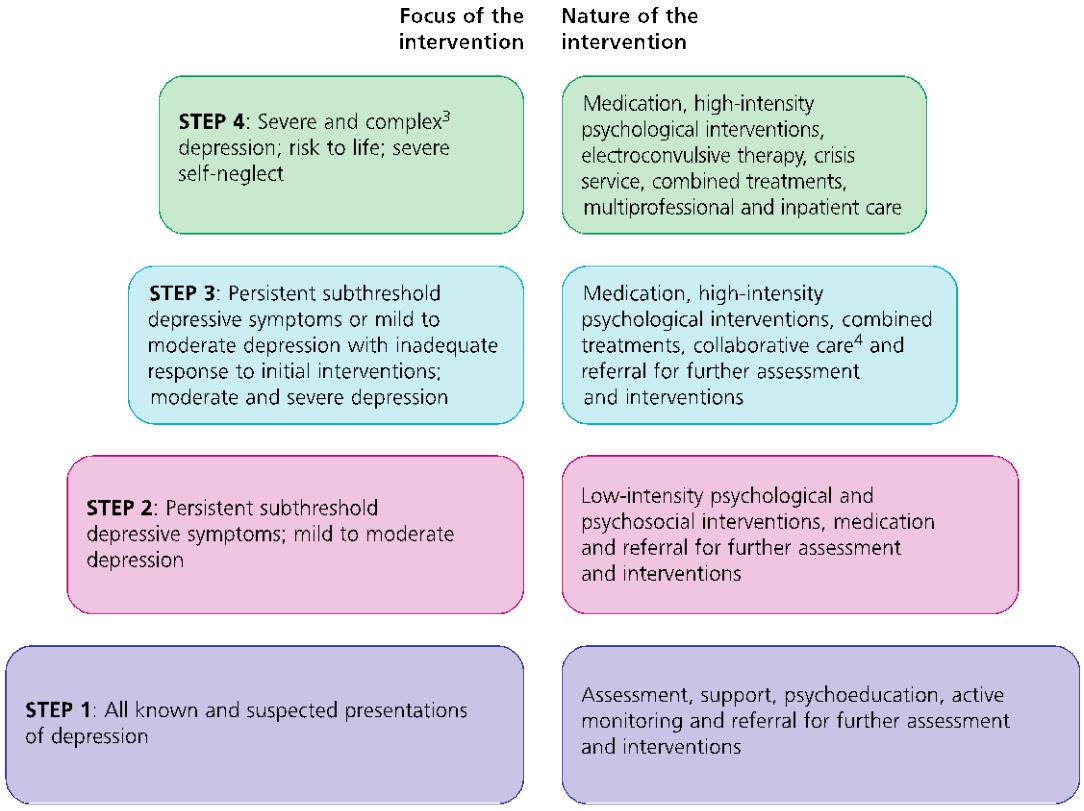


Figure 19. Stepped care model of delivery for treatment of depression (NICE, 2009).

By using the stepped care model individuals are provided with the appropriate level of therapy depending on their current clinical presentation and symptomatology. Therapeutic interventions begin at Step 2, known as 'Low intensity' interventions, offered for mild to moderate depression. Treatment at this step includes guided self-help based on Cognitive Behavioural Therapy (CBT) principles, which can incorporate behavioural activation and problem-solving techniques, Computerised Cognitive Behavioural Therapy, and group based CBT. At Step 3 treatment options include anti-depressant medication or 'High intensity' psychological interventions. The NICE recommended treatments include CBT, Interpersonal Therapy (IPT), Behavioural Activation or

Behavioural Couples Therapy, in conjunction with pharmacological treatment. At Step 4 the suggested treatment possibilities include inpatient care, crisis resolution, home treatment teams and Electroconvulsive therapy.

Within this stepped care model, behavioural activation is positioned as a standalone treatment in Step 3. Treatment at step 2 could include elements of behavioural activation as part of guided self-help within a CBT framework.

Cognitive-Behavioural Therapy for Depression

Several models have contributed to the study of depression from a cognitive perspective. Key researchers have included Ellis (1962), Beck (1967) and Bower (1981). Beck's model of depression is the approach underlying the form of CBT used most widely in the National Health Service in the UK today. This model involves three key components; the negative cognitive triad, schemas and cognitive errors. The negative cognitive triad suggested that a depressed individual would display negative patterns in their thinking with regard to themselves (e.g. 'I'm defective'), their future (e.g. 'I'll feel like this forever') and the world (e.g. 'the world is against me'). Beck postulated that other symptoms of depression would follow as a direct consequence of these patterns of thinking. This cognitive triad remains influenced and maintained by a set of idiosyncratic 'schema' guiding the person's response to particular events. Beck hypothesised that these schemas developed following on from early experiences leading to biases in information processing or 'cognitive errors' such as 'overgeneralisation', 'personalisation' and 'absolutistic' or 'dichotomous' thinking.

Beck's (1976) therapy approach focusing on the 'here and now', exploring the individual's maladaptive thinking styles and patterns which could contribute to the maintenance of depression. Another key component of CBT is the development of a strong therapeutic alliance, with collaborative and active engagement between the individual and therapist. CBT aims to educate the individual, and provide them with skills to become their own therapist. Ultimately, the individual should be able to carry these skills forward, beyond the end of therapy. Relapse prevention is strongly emphasised and forms an integral part of the final sessions. Sessions are structured using an agenda and are time limited from the onset of therapy. Strong research evidence exists highlighting the efficacy of CBT for unipolar depression (e.g. Butler, Chapman, Forman & Beck, 2006).

NICE guidelines recommend CBT at step 3, with individuals expected to receive between 16 to 20 sessions initially and a further 3 to 4 follow up sessions over three to six months if needed.

Antidepressant medication

Antidepressants were initially developed in the 1950's and several different kinds are available, including tricyclics and selective serotonin reuptake inhibitors (SSRI). They work by increasing levels of neurotransmitters within the body; in particular levels of serotonin and noradrenaline are targeted by antidepressants. NICE guidelines recommend the use of medication at step 2 within the stepped care model for depression.

Interpersonal therapy

Interpersonal therapy (IPT; Klerman, Weissman, Rounsaville & Chevron, 1984) can also be found within the NICE guidelines for depression. IPT is a time limited and pragmatic therapy, which posits that depression, occurs within an interpersonal context. Within IPT, depression has been described as illness which can be treated. Links to social roles have been highlighted, suggesting that depression affects social roles as aversive events lead to depressed mood, thus leading to poorer social functioning and more aversive events occurring. Another key component of IPT involves linking interpersonal events to affect. Research studies have demonstrated the efficacy of IPT (e.g. Weissmann, Prusoff, DiMascio, Neu, Goklaney & Klerman, 1979; Barber & Muenz, 1996; Ryder, Quilty, Vachon, Bagby, 2010). Weissmann et al (1979) showed that a combination treatment of IPT and ADM was more effective than either treatment alone. Like CBT, IPT is recommended at step 3 of the stepped care model. Individuals should receive between 16 to 20 sessions over a three to four month time period.

Appendix B – Patient Health Questionnaire

Over the last **two weeks**, how often have you been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless.	0	1	2	3
3. Trouble falling/staying asleep, sleeping too much.	0	1	2	3
4. Feeling tired or having little energy.	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television.	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual.	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way.	0	1	2	3

PHQ-9 total score ☐

Appendix C – Behavioural Activation and Depression Scale

Please read each statement carefully and then circle the number which best describes how much the statement was true for you DURING THE PAST WEEK, INCLUDING TODAY.

0 = Not at all 1 2 = A little 3 4 = A lot 5 6 = Completely	0	1	2	3	4	5	6	For Scoring Purposes only				
								AC	AR	WS	SI	T
1. I stayed in bed for too long even though I had things to do.	O	O	O	O	O	O	O			_		R
2. There were certain things I needed to do that I didn't do.	O	O	O	O	O	O	O			_		R
3. I am content with the amount and types of things I did.	O	O	O	O	O	O	O	_				_
4. I engaged in a wide and diverse array of activities.	O	O	O	O	O	O	O	_				_
5. I made good decisions about what type of activities and/or situations I put myself in.	O	O	O	O	O	O	O	_				_
6. I was active, but did not accomplish any of my goals for the day.	O	O	O	O	O	O	O			_		R
7. I was an active person and accomplished the goals I set out to do.	O	O	O	O	O	O	O	_				_
8. Most of what I did was to escape from or avoid something unpleasant.	O	O	O	O	O	O	O		_			R
9. I did things to avoid feeling sadness or other painful emotions.	O	O	O	O	O	O	O		_			R
10. I tried not to think about certain things.	O	O	O	O	O	O	O		_			R
11. I did things even though they were hard because they fit in with my long-term goals for myself.	O	O	O	O	O	O	O	_				_
12. I did something that was hard to do but it was worth it.	O	O	O	O	O	O	O	_				_
13. I spent a long time thinking over and over about my problems.	O	O	O	O	O	O	O		_			R

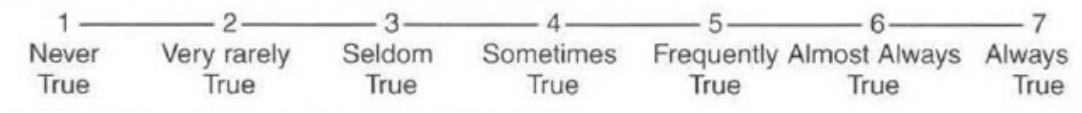
0 = Not at all 1 = 2 = little 3 = 4 = A lot 5 = 6 = Completely	0	1	2	3	4	5	6	For Scoring Purposes only				
								AC	AR	WS	SI	T
14. I kept trying to think of ways to solve a problem but never tried any of the solutions.	○	○	○	○	○	○	○		_			R
15. I frequently spent time thinking about my past, people who have hurt me, mistakes I've made, and other bad things in my history.	○	○	○	○	○	○	○		_			R
16. I did not see any of my friends.	○	○	○	○	○	○	○				_	R
17. I was withdrawn and quiet, even around people I know well.	○	○	○	○	○	○	○				_	R
18. I was not social, even though I had opportunities to be.	○	○	○	○	○	○	○				_	R
19. I pushed people away with my negativity.	○	○	○	○	○	○	○				_	R
20. I did things to cut myself off from other people.	○	○	○	○	○	○	○				_	R
21. I took time off of work/school/chores/responsibilities simply because I was too tired or didn't feel like going in.	○	○	○	○	○	○	○			_		R
22. My work/schoolwork/chores/responsibilities suffered because I was not as active as I needed to be.	○	○	○	○	○	○	○			_		R
23. I structured my day's activities.	○	○	○	○	○	○	○	_				_
24. I only engaged in activities that would distract me from feeling bad.	○	○	○	○	○	○	○		_			R
25. I began to feel badly when others around me expressed negative feelings or experiences.	○	○	○	○	○	○	○		_			R

Subscale Totals: __ __ __ __

BADS Total: __

Appendix D – Acceptance and Action Questionnaire

Below you will find a list of statements. Please rate the truth of each statement as it applies to you. Use the following scale to make your choice.



1. I am able to take action on a problem even if I am uncertain what is the right thing to do.

2. A person who is really “together” should not struggle with things the way I do.

3. When I feel depressed or anxious, I am unable to take care of my responsibilities.

4. I try to suppress thoughts and feelings that I don’t like by just not thinking about them.

5. There are not many activities that I stop doing when I am feeling depressed or anxious.

6. It’s OK to feel depressed or anxious.

7. It’s unnecessary for me to learn to control my feelings in order to handle my life well.

8. I rarely worry about getting my anxieties, worries, and feelings under control.

9. In order for me to do something important, I have to have all my doubts worked out.

10. I’m not afraid of my feelings.

11. When I compare myself to other people, it seems that most of them are handling their lives better than I do.

12. I try hard to avoid feeling depressed or anxious.

13. Anxiety is bad.

14. Despite doubts, I feel as though I can set a course in my life and then stick to it.

15. If I could magically remove all the painful experiences I’ve had in my life, I would do so.

16. I am in control of my life.

Appendix E – Ruminative Response Scale

People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you *generally* do, not what you think you should do.

1 almost never **2 sometimes** **3 often** **4 almost always**

1. Think about how alone you feel.

2. Think “I won’t be able to do my job if I don’t snap out of this”.

3. Think about your feelings of fatigue and achiness.

4. Think about how hard it is to concentrate.

5. Think “What am I doing to deserve this?”

6. Think about how passive and unmotivated you feel.

7. Analyse recent events to try to understand why you are depressed.

8. Think about how you don’t seem to feel anything anymore.

9. Think “Why can’t I get going?”

10. Think “Why do I always react this way?”

11. Go away by yourself and think about why you feel this way.

12. Write down what you are thinking about and analyse it.

13. Think about a recent situation, wishing it had gone better.

14. Think “I won’t be able to concentrate if I keep feeling this way.”

15. Think “Why do I have problems other people don’t have?”

16. Think “Why can’t I handle things better?”

17. Think about how sad you feel.

18. Think about all your shortcomings, failings, faults, mistakes.

19. Think about how you don’t feel up to doing anything.

20. Analyse your personality to try to understand why you are depressed.

21. Go someplace alone to think about your feelings.

22. Think about how angry you are with yourself.

Appendix F – Cognitive Behavioural Avoidance Scale

Instructions: Different people use different strategies to deal with situations and problems in their lives. Below are a number of strategies that people may use to deal with situations and problems. A number of the items below refer to dealing with situations at work or school. If you are not currently working or attending school, answer these items instead using your daily duties and activities. Please read each statement carefully and indicate how true, ***in general,*** each statement is for you using the following key:

1= Not at all true for me
2= Somewhat true for me
3= Moderately true for me
4= Very much true for me
5= Extremely true for me

1. I avoid attending social activities.	1	2	3	4	5
2. When uncertain about my future, I fail to sit down and think about what I really want.	1	2	3	4	5
3. I would like to achieve things at work/school, but I have to accept my limits.	1	2	3	4	5
4. I fail to do what is needed to follow through with achievement goals I have set for myself.	1	2	3	4	5
5. In order to avoid feelings of disappointment, I just try not to get too serious about work/school.	1	2	3	4	5
6. Rather than try new activities, I tend to stick with the things I know.	1	2	3	4	5
7. I choose to turn down opportunities to further my education/career.	1	2	3	4	5
8. I do not answer the phone in case people are calling with social invitations.	1	2	3	4	5
9. I quit activities that challenge me too much.	1	2	3	4	5
10. I try not to think about problems in my personal relationships.	1	2	3	4	5
11. I think to myself that I will not be able to complete really challenging tasks.	1	2	3	4	5
12. While I know I should make decisions about my personal relationships, I just let things go on as they are.	1	2	3	4	5
13. I avoid trying new activities that hold the potential for failure.	1	2	3	4	5
14. I do not go out to events when I know there will be a lot of people I do not know.	1	2	3	4	5
15. Instead of thinking about problems in my social life, I tell myself that I prefer to be alone.	1	2	3	4	5
16. I fail to discuss/address tension that builds in a friendship.	1	2	3	4	5
17. I find that I often want to leave social gatherings.	1	2	3	4	5
18. I do not try to think about ways to improve my work/school performance.	1	2	3	4	5
19. I try not to think about my future and what I will do with my life.	1	2	3	4	5
20. I just wait out tension in my relationships hoping that it will go away.	1	2	3	4	5
21. I tend to make up excuses to get out of social activities.	1	2	3	4	5

22. There is nothing I can do to improve problems in my relationships.	1	2	3	4	5
23. I turn down opportunities to socialize with the opposite sex.	1	2	3	4	5
24. I tend to remain to myself during social gatherings or activities.	1	2	3	4	5
25. I avoid making decisions about my future.	1	2	3	4	5
26. When I experience confusion in my relationships, I do not try to figure things out.	1	2	3	4	5
27. While I know that I have to make some important decisions about school/work, I just do not get down to it.	1	2	3	4	5
28. Rather than getting out and doing things, I just sit at home and watch TV.	1	2	3	4	5
29. I distract myself when I start to think about my work/school performance.	1	2	3	4	5
30. I do not bother thinking about how to solve problems in my family – it is useless.	1	2	3	4	5
31. I find myself avoiding tasks and assignments that are really important.	1	2	3	4	5

Appendix G – Sociodemographic information

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Investigating Mechanisms of Behavioural Activation Treatment for Depression

Please complete the following questions:

1. What gender are you?
   ☐Male ☐Female

2. Which age bracket do you fall into?
   ☐18 – 29 years ☐ 30- 49 years ☐50 – 64 years

3. What is your marital status?
   ☐Single ☐ Married ☐Divorced
   ☐Widowed ☐ Separated

4. Which ethnic group do you belong to?
   ☐White ☐ Black African ☐Black Caribbean
   ☐Indian ☐ Pakistani ☐Bangladeshi
   ☐Chinese ☐ Other – please state……..

5. What is your current occupation?
   ☐Full-time employed ☐Part-time employed ☐Unemployed
   ☐Studying ☐Retired

6. What is the highest level education that you have achieved?
   ☐High school ☐NVQs ☐A levels
   ☐Diploma ☐Undergraduate degree ☐Postgraduate degree

7. Have you previously experienced depression?
   ☐Yes ☐No
   If yes, when was this? ……..

8. Any other history of mental health problems?
   ☐Yes ☐No
   If yes, please provide some more information ……..

9. Are you currently taking and/or prescribed any medication for depression?

☐Yes ☐No

If yes, please provide some more information (name, dosage and how often you take it) ……

10. Have you previously received any psychological treatment?

☐Yes ☐No

If yes, please provide some more information ……

Thank you for completing these questions.

Appendix H – Participant Information Sheet

South London and Maudsley NHS Foundation Trust | Institute of Psychiatry at the Maudsley | King's College London, University of London

Participant Information Sheet *Version 3 (14th March 2013)*

Investigating Mechanisms of Behavioural Activation Treatment for Depression

We are inviting you to take part in a research study that is being completed as part of a Doctorate in Clinical Psychology. Before you make a decision, it will be important for you to understand why the research is being carried out, and what it will involve. Please take time to read the following information carefully so that you can confidently decide whether or not you would like to take part in this study. You may also want to discuss this decision with your partner, relatives or friends. Please feel free to contact us if there is anything that is not clear or if you would like more information.

What is the purpose of the study?
We are interested examine the effects of an intervention for depression called Behavioural Activation (BA) for Depression. BA is recommended for the treatment of depression. It has been found to have positive effects for individuals experiencing depression by reducing the number of symptoms experienced. BA involves activity scheduling. This looks at structuring your day with activities that you may be avoiding but are actually consistent with the values and beliefs that are important to you.

We are interested in learning more about what specifically leads to a reduction in symptoms of depression. Several studies have found BA to be helpful for reducing emotional difficulties like depression. However, research has not yet looked at what parts of BA lead to symptom reduction. We hope that the results of this study will help us to continue to improve BA and help develop it further in order to individuals experiencing other emotional difficulties.

Why have I been chosen?
We are asking 40 people with symptoms of depression and anxiety to take part in this study. You have been given this information sheet because you were referred to Lambeth Psychological Therapies Service and expressed an interest in the study.

Do I have to take part?
No, it is completely up to you whether or not you decide to take part. We will go through this information sheet with you, and you will be able to ask any questions you have about it. If you agree to take part after this then we will ask you to sign a consent form. You will be free to withdraw from the study at any time, without giving a reason, and this will not affect your future NHS treatment or legal rights.

What will the study involve if I take part?
You will be randomly assigned to one of two groups. In both cases, you will receive a single, 90-minute session of Behavioural Activation. If you are assigned to the 'treatment' group then you will receive the BA session as we are able to arrange an appointment. If you are assigned to the 'waiting list control' group then you will be asked to wait for 3 weeks before receiving the BA session.

During the BA session, you will work with the researcher to develop a behavioural plan, after which you will be asked to engage in several desirable activities for a period of one week. During this time you will be asked to complete an activity log.

The study will involve meeting with the researcher on 2 occasions. On both occasions you will be asked to complete 5 short questionnaires in order for us to monitor how you are feeling. You will also be asked to complete a short computerized task. The questionnaires and the computer tasks will take around 30-45 minutes to complete. If you are in the 'treatment' group then your first meeting will take up to 2 hours and 30 minutes. If you in the 'waiting list control' group then your first meeting will take up to 1 hour. The second meeting for both groups will take up to 1 hour.

At the end of treatment you will be given £20 to cover any expenses you may have incurred while taking part in this study (e.g. for travel).

What are the possible disadvantages and risks of taking part?
As is the case with all therapies, we cannot guarantee that BA will benefit everyone who receives it. Therefore, there is a possibility that your mood may worsen or not completely improve by the end of treatment. If your mood does get worse and you express an intention to harm yourself or another person, we will withdraw you from the study and refer you back to Lambeth Psychological Therapies Service for more support. Similarly, if you still experience significant symptoms of depression or anxiety at the end of treatment you will also be withdrawn from the study and referred back to Lambeth Psychological Therapies Service.

What are the possible benefits of taking part?
You will receive a type of therapy that has been shown to benefit people with depression. We hope that the information we get from this study might help us to develop more ways of helping individuals experiencing other emotional difficulties in the future.

What if there is a problem?
If you have any concerns about the way you have been approached or treated during this study, then please contact Miss Farjana Nasrin, Addictions Science Building, 3rd Floor, 4 Windsor Walk, Denmark Hill, London, SE5 8AF, Tel: 07804 804610. Alternatively, you can contact Dr. Katharine Rimes at the same address. If you wish to complain formally, then you can do this through the NHS Complaints Procedure (details of which can be obtained from South London and Maudsley NHS Trust).

Will my taking part in this study be kept confidential?

All information collected about you and from the BA session will be anonymous. You will be given a unique identification number so that it will not be possible to identify you from the information. All information will also be kept strictly confidential, and will only be seen by members of the research team. All information will be stored securely in locked cabinets at NHS sites or at the Institute of Psychiatry.

Will my doctor be informed?
If you take part in the study, we will write to your GP to inform them of this and again when you have finished participating in the study. We will also contact your GP if we become concerned for your safety or another person's safety whilst you are taking part in the study (e.g. if you express an intention to harm yourself or another person). This is so that you can be referred for more support.

What will happen to the results of the study?
When we have collected all the information we need, we will analyse them and then publish the results. We will also send you a summary of the results. You will not be identified in any publication from this study.

Who has reviewed the study?
This study has been reviewed and given favourable opinion by the London City Road and Hampstead NRES ethics committee (REC reference – 13/LO/0018). Miss Farjana Nasrin's educational supervisors, Dr. Katharine Rimes and Dr. Andrea Reincke, have also reviewed it.

Who can I get independent advice from about taking part in the study?
You can get independent advice about taking part in the study from South London and Maudsley/Institute of Psychiatry Research and Development Office, Institute of Psychiatry, De Crespigny Park, London, SE5 8AF, Tel: 020 7848 0251.

Who do I contact for further information?
If you have any questions or require any further information about this study, then please contact Miss Farjana Nasrin, Addictions Science Building, 3rd Floor, 4 Windsor Walk, Denmark Hill, London, SE5 8AF, Tel: 07804 804610.

Thank you for considering taking part in this study

Appendix I – Consent form

South London and Maudsley NHS Foundation Trust | Institute of Psychiatry at the Maudsley | King's College London, University of London

Consent Form for Participants ***Version 3 (14th March 2013)***

Investigating Mechanisms of Behavioural Activation Treatment for Depression

Please initial the boxes:

I confirm that I have read and understand the information sheet dated **14th March 2013 (Version 3)** for the above study. ☐

I have had the opportunity to consider the information and ask questions about the above study. ☐

I understand that relevant sections of my medical notes and data collected during the study may be looked at by the researcher where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records ☐

I understand that my GP will be informed of my participation in this study. ☐

I understand that Lambeth Psychological Therapies Service will be informed of my participation in this study. ☐

I understand that Lambeth Psychological Therapies Service will be contacted if I express an intention to harm myself or another person. ☐

I understand that my participation is voluntary and that I am free to withdraw from the study at any time, without having to give a reason, and without my NHS treatment or legal rights being affected. ☐

I understand that I will be asked to complete a set of questionnaires (5 in total) and an experimental task on the computer two times and I agree to do this. ☐

I understand I will be asked once to provide some demographic information about myself (age, ethnicity, working status and marital status). ☐

I understand that I will be asked once to complete a diagnostic interview screening for depression. ☐

I understand that I might be asked to undertake a behavioural activation ☐

treatment for depression which involves engaging in desirable activities of my choice for a period of 7 days, and completing an activity log during this time.

If I am not asked to undertake the behavioural activation treatment for depression immediately, then I will be offered this intervention following the end of my participation in this study. ☐

I agree to take part in the above study. ☐

Name of participant ……
(IN CAPITALS)

Participant's signature ..... Date: .....

The researcher has explained the study to the participant and has answered the participant's questions honestly and fully.

Name of researcher ……
(IN CAPITALS)

Researcher's signature ..... Date: .....

Thank you for helping with this research

Appendix J – Letter to GP

Letter to GP ***Version 1 (16th January 2013)***

Investigating Mechanisms of Behavioural Activation Treatment for Depression

Institute of Psychiatry,
Addictions Sciences Building,
3rd Floor, 4 Windsor Walk,
Denmark Hill
London SE5 8AF

<DATE>

Dear <GP>

Re: <NAME OF PARTICIPANT> D.O.B.:

I am writing to inform you that <NAME OF PARTICIPANT> has consented to taking part in the above study. As part of the study X was randomly assigned to receiving a single, 90 minute session of Behavioural Activation treatment for Depression in one month's time/or on <DATE>. <NAME OF PARTICIPANT> was seen on two occasions and her first session was on <DATE OF SECOND SESSION>. S/he will be contacted in a month about receiving this single treatment session.

I have enclosed a copy of the Participant Information Sheet for your reference. This study has been favourably reviewed by the Research Ethics Committee and has received ethical approval (REC reference 13/LO/0018). I will contact you if we become concerned about <NAME OF PARTICIPANT> safety during the course of the study (e.g. due to expressing suicidal ideation).

If you have any further questions then please feel free to email me at Farjana.nasrin@kcl.ac.uk.

Yours sincerely,

Farjana Nasrin
Trainee Clinical Psychologist & Chief Investigator

Appendix K – Modified BATD treatment protocol

- **UNITS 1 through 4.**

- **"***You may not presently feel as though you are able to get much done or that you are always tired and lack motivation. You also may be waiting to feel better or think more positively before you become more active and start participating in activities that once brought you pleasure. As you know, however, getting yourself to feel better is not an easy thing to do. Therefore, we'd like you to try something different. The idea of the treatment we are about to begin is that your thoughts and feelings are affected by your interactions with others and your overall quality of life. So, we believe that for you to have more positive thoughts and feelings and to feel better, you must first become more active and put yourself into more positive situations. Although this may be difficult right now, it will become easier as more and more positive experiences occur. The treatment requires you to work hard, and I understand that you may be questioning your ability to make changes at this time in your life, but I will help you throughout this process, and we will work at a pace at which you feel comfortable*.**"**

- Explain/instruct participants on the following:
  Unit 2 – Recognizing Depression

You may or may not have experienced symptoms of depression that include;

- *Poor appetite or over eating*
- *Not getting enough sleep, or sleeping too much, or tiredness*
- *Low energy or self esteem*
- *Low self esteem*
- *Poor concentration or difficulty making decisions*
- *Feelings of hopelessness*
- *An unrealistic sense of guilt or worthlessness*
- *Frequently thinking about failings in the past*
- *Thoughts about death*
- *Decreased desire to engage in activities that you once found rewarding*

Do you think any of these symptoms apply to you?

- *Symptoms of depression may produce significant impairment in your life such as an inability to take classes, hang out with your friends, work, cook, exercise, and so forth. You may also have decreased optimism/motivation, low self-esteem, difficulties concentrating, fatigue and possibly extreme behaviors such as self-injury and or suicidal thoughts. Medical consequences may include heart disease, inability to fight off illness, abusing drugs or alcohol, and poor eating habits.*

- Explain/instruct participants on the following:
  Unit 3 – The Rationale for BATD

- *When depressive symptoms are recognized, a number of treatment alternatives are available. The treatment you will be provided with is a modified form of another treatment that has already been supported as being effective in treating people with depression. This treatment is environmental/behavioural in nature, which means that it* ***targets changes*** *in your* ***environment*** *and* ***behaviour*** *as a method for improving your thoughts, mood, and overall quality of life. Although we are focusing on* ***behaviour change****, we are not ignoring thoughts and feelings. Instead we suggest that negative thoughts and feelings often will change only after positive events and consequences are experienced more frequently. Said more simply, it is difficult to feel depressed and have low self-esteem if you are regularly* ***engaging in activities*** *that bring you a sense of pleasure and/or accomplishment.*

- Explain/instruct participants on the following:
  Unit 5 GETTING STARTED

LIFE AREAS ASSESSMENT SHEET:

- **Identifying potential activities***:*
- *As a first step in this protocol, you must determine some activities you would like to target. In determining these activities, you might want to consider activities related to your values and goals as they relate to certain life areas:*

The participant and ***investigator*** then collaboratively establish structured goals by completing the following "**Life Areas Assessment.**" Using the Life Goal assessment and using some of these questions as prompts, discuss each of the life areas and write down what the patient would like to accomplish in each of the areas.

1. Family Relationships (e.g., What type of brother/ sister, son/ daughter, father/ mother do you want to be? What are your strengths? Weaknesses? Which relationships would you like to improve? What qualities are important in close family relationships? What might you be able to do to make the relationships better?)
2. Social Relationships (e.g., What would an ideal friendship be like to you? Are certain relationships poor at the moment? What areas could be improved in your relationships with your friends? Do you have enough friends?)
3. Intimate Relationships (e.g., What would your role be in an intimate relationship?Are you currently involved in this type of relationship, or would you like to be?)
4. Education/ Training/Learning (e.g., How are your classes currently going? Do you need to have more study time? Scheduled study time? What would you like to learn more about?)
5. Hobbies/ Recreation/Leisure (e.g., Are there any special interests you would like to pursue, or new activities you would like to experience?)
6. Physical/ Health Issues (e.g., Do you wish to improve your diet, sleep, exercise, should you lose some weight?)
7. Spirituality (e.g., What, if anything, does spirituality mean to you? Are you satisfied with this area of your life? Would you like to become more spiritual?)
8. Mental Health Issues (e.g., Are there other issues besides depression that you would like to explore in this treatment? Do you avoid certain situations because of fear or anxiety? Would you like to face these situations? Do you need to relax more?).

Life Goal Assessment

Instructions: Describe goals that you would like to accomplish in these areas.

1. Family Relationships

_____
_____

2. Social Relationships

_____
_____

3. Intimate Relationships

_____
_____

4. Education/Training

_____
_____

5. Hobbies/ Recreation

_____
_____

6. Physical/ Health Issues

_____
_____

7. Spirituality

_____
_____

8. Psychological/ Anxiety/ Avoidance Issues

_____
_____

MASTER ACTIVITY LOG:

- Based on the Life goal assessment, identify 8-10 activities that the student will monitor over the next two weeks.

- *In general, if you believe that completing a particular activity would bring a sense of pleasure and/or accomplishment, then it probably would be good to include it. When selecting activities, they should be both **observable by others and measurable**.*

- *Now that you have identified the 8-10 target activities, you will need a plan for how you will assess your progress.*
- *The master activity log is a useful way of tracking your progress on a weekly basis. In the first column, we will list your activities. In the columns next to the activity we will list the following:*
- *The number of times you will complete the activity in each of your two weeks (e.g. ideal frequency) and*
- *The duration of the activity (you may write UF, signifying that the activity will continue until finished regardless of the duration).*

- *For each activity selected, write down the frequency (#) and duration (Time) goals in the appropriate columns. **Only the experimenter needs to have a copy of the master activity log.***

- **BEHAVIOR CHECKOUT**
- *Now you are ready to record your progress on a daily basis using the weekly behavior checkout. Let's write down your behaviors as well as the frequency and duration goals in the appropriate columns for each activity.*
- *You have two behavior checkouts. One for Week 1 and one for Week 2.*
- *Each day you circle Y if you completed the activity and N if you did not.*
- *To ensure that you maintain accurate records, it is best if you allocate a specific time of the day to complete this task (e.g., before bedtime). Once you complete the desired frequency and duration goal for the week, you may circle G (goal) as well as Y or N.*
- *Circling G acknowledges that regardless of whether you engaged in that activity on that day, you have successfully met our goal for the week. Furthermore circling G should help to keep you from feeling guilty about not completing an activity on a given day if you are regularly completing your weekly goals.*
- ***Remember – It is essential that you bring BOTH behavioral checkouts back with you to your second meeting with me.***

Appendix L – Life activities checklist

EXCURSIONS/COMMUNITY	✓	ENTERTAINMENT	✓
1. Taking a trip		1. Watching a different TV show	
2. Going to a fair, carnival, circus or zoo		2. Going to watch a film at the cinema	
3. Going to the beach		3. Going to the theatre	
4. Going on a picnic		4. Going to a sporting event	
5. Going out to dinner		5. Watching the sunrise	
6. Taking a road trip		6. Watching the sunset	
7. Going to a different part of London		7. Having a bubble bath	
8. Staying at a hotel or bed and breakfast		8. Other……. ……..	
9. Camping		**SPORTS AND GAMES**	
10. Going to a museum or exhibit		1. Going for a swim	
11. Shopping at a car boot market		2. Going for a bike ride	
12. Going to the library or book store		3. Going for a short jog	
13. Going out for a short walk		4. Going bird watching	
14. Other ……..		5. Playing a board game	
INTERACTIONS WITH OTHERS OR SOCIAL ACTIVITIES		6. Completing a puzzle, crossword or brain teaser	
1. Going to or giving a party		7. Playing a card game	
2. Reminiscing and talking about old times		8. Playing a computer game	
3. Group activities		9. Other ……	
4. Having an open conversation		**EDUCATION**	
5. Meeting up with friends		1. Learning something new (e.g. making a new food item)	
6. Discussing a topic of interest		2. Learning something artistic (e.g. painting)	
7. Having family or visiting family		3. Reading a book or magazine	
8. Meeting someone new		4. Writing a short story or poem	
9. Eating out with friends		5. Other ……	
10. Visiting friends or having friends		**DOMESTIC ACTIVITIES**	

visit			
11. Speaking to someone on the telephone who you haven't spoken to in a while		1. Working in the garden for a short time	
12. Other……..		2. Baking	

Appendix M – Behavioural checkout sheet

Weekly Behaviour Checkout

Behaviour Checkout - Week ___1____

Activity	#	Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
			Y N G	Y N G	Y N G	Y N G	Y N G	Y N G	Y N G
			Y N G	Y N G	Y N G	Y N G	Y N G	Y N G	Y N G
			Y N G	Y N G	Y N G	Y N G	Y N G	Y N G	Y N G
			Y N G	Y N G	Y N G	Y N G	Y N G	Y N G	Y N G
			Y N G	Y N G	Y N G	Y N G	Y N G	Y N G	Y N G
			Y N G	Y N G	Y N G	Y N G	Y N G	Y N G	Y N G
			Y N G	Y N G	Y N G	Y N G	Y N G	Y N G	Y N G
			Y N G	Y N G	Y N G	Y N G	Y N G	Y N G	Y N G
			Y N G	Y N G	Y N G	Y N G	Y N G	Y N G	Y N G
			Y N G	Y N G	Y N G	Y N G	Y N G	Y N G	Y N G
			Y N G	Y N G	Y N G	Y N G	Y N G	Y N G	Y N G
			Y N G	Y N G	Y N G	Y N G	Y N G	Y N G	Y N G

Each day you circle Y if you completed the activity and N if you did not. To ensure that you maintain accurate records, it is best if you allocate a specific time of the day to complete this task (e.g., before bedtime). Once you complete the desired frequency and duration goal for the week, you may circle G (goal) as well as Y or N. Circling G means that regardless of whether you engaged in that activity on that day, you have successfully met your goal for the week. Furthermore circling G should help to keep you from feeling guilty about not completing an activity on a given day if you are regularly completing your weekly goals.

Appendix N – Ethical approval

NHS
Health Research Authority

NRES Committee London - City Road & Hampstead

Bristol Research Ethics Committee Centre
Level 3, Block B
Whitefriars
Lewins Mead
Bristol
BS1 2NT

Tel: 0117 342 1385
Fax: 0117 342 0445

15 April 2013

Miss Farjana Nasrin
Trainee Clinical Psychologist
Camden and Islington NHS Foundation Trust
3rd Floor, Addiction Sciences Building, 4 Windsor Walk, Denmark Hill
SE5 8AF

Dear Miss Nasrin

Study title:	**Investigating the mechanisms of change in Behavioural Activation treatment for Depression**
REC reference:	**13/LO/0018**
Amendment number:	**Substantial Amendment 1**
Amendment date:	**14 March 2013**
IRAS project ID:	**117233**

The above amendment was reviewed at the meeting of the Sub-Committee held on 27 March 2013 by the Sub-Committee in correspondence.

Ethical opinion

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

Document	Version	Date
Questionnaire: Cognitive Behavioural Avoidance Scale		
Participant Consent Form	3	14 March 2013
Participant Information Sheet	3	14 March 2013
Protocol	2	28 November 2012
Notice of Substantial Amendment (non-CTIMPs)		14 March 2013
Covering Letter		14 March 2013
Protocol	3	14 March 2013

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

R&D approval

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

We are pleased to welcome researchers and R & D staff at our NRES committee members' training days – see details at http://www.hra.nhs.uk/hra-training/

13/LO/0018:	**Please quote this number on all correspondence**

Yours sincerely

Mr Robert Goldstein
Alternate Vice Chair

E-mail: nrescommittee.london-cityroadandhampstead@nhs.net

Enclosures: *List of names and professions of members who took part in the review*

Copy to: *Ms Jennifer Liebscher, Institute of Psychiatry*

Service Evaluation Project

Using the Standardised Assessment of Personality – Abbreviated Version (SAPAS) in the Southwark Psychological Therapies ServiceInvestigating the

Supervised by Dr Janet Wingrove,
Southwark Psychological Therapies Service

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1. Abstract

Limited research has been carried out exploring the presence of personality disorder in IAPT patient populations and subsequent impact on engagement with therapist and the service. This study aimed to evaluate the pilot use of a brief personality disorder measure, Standardised Assessment of Personality - Abbreviated Scale (SAPAS). The SAPAS was used at the assessment stage, in addition to the measures specified in the IAPT minimum dataset, to explore whether SAPAS scores can predict engagement with the service and allocation to step in the care pathway. The results of this study indicate that the SAPAS did not predict engagement – patients scoring high on the SAPAS were just as likely to engage as those with lower scores. However, they were more likely to have been allocated to high intensity therapy. This suggests that patient with high scores on the SAPAS should not be screened out because of likely disengagement. However, a longer-term study with larger sample is needed to explore the impact on outcomes.

2. Introduction

2.1 Southwark Psychological Therapies Service

Southwark Psychological Therapies Service (SPTS) is an Improving Access to Psychological Therapy (IAPT) service, one of the first wave of IAPT services rolled out in 2008.

IAPT services, such as SPTS, were commissioned to provide psychological therapy for adults experiencing common mental health disorders, primarily anxiety and depression. The majority of referrals come from GPs, with self-referrals also being accepted. Some referred patients have a significant history of engagement with mental health services, with previous psychiatric assessments and diagnoses. However, as a primary care service SPTS receives many referrals from patients who are having their first encounter with mental health services. Consequently, there may be little, if any, existing information about their likely mental health needs.

IAPT services are characterised by several key features. These include the use of a stepped care framework, routine outcome measures and the use of National Institute for Health and Clinical Excellence (NICE) recommended therapies which are evidence based.

SPTS utilises a ‘stepped care’ approach as described in IAPT Implementation Plan: National guidelines for regional delivery (Department of Health, 2008). The guidelines suggest that there are two fundamental principles of stepped care; using the least burdensome treatment with the highest likelihood of delivering a positive outcome and a system whereby patients can be ‘stepped up’ or ‘stepped down’ if a different treatment would be more effective or appropriate.

Another feature of IAPT services is the use of routine outcome monitoring. Patients are required to complete outcome measures at every clinical contact in order to assess progress and trigger a review of the patient’s needs and possibility of stepping up or down when appropriate.

NICE-recommended low and high intensity interventions are shown in Figure 1. The most commonly used low intensity interventions in SPTS are guided self help. These are delivered by Psychological Wellbeing Practitioners (PWP) and referred to as low intensity (LI) therapy. The most commonly used high intensity (HI) intervention in SPTS is Cognitive Behavioural Therapy (CBT), which are delivered by High Intensity therapists. Patients are allocated to a low or high intensity intervention based on presenting problem, symptom chronicity and severity, response to previous treatment, clinical judgement and patient choice. However, the possible presence of personality disorder, and its implications for treatment has not been considered in any systematic way. If personality disorders are not recognised at the triage and assessment stage, this may lead to inappropriate treatments being offered.

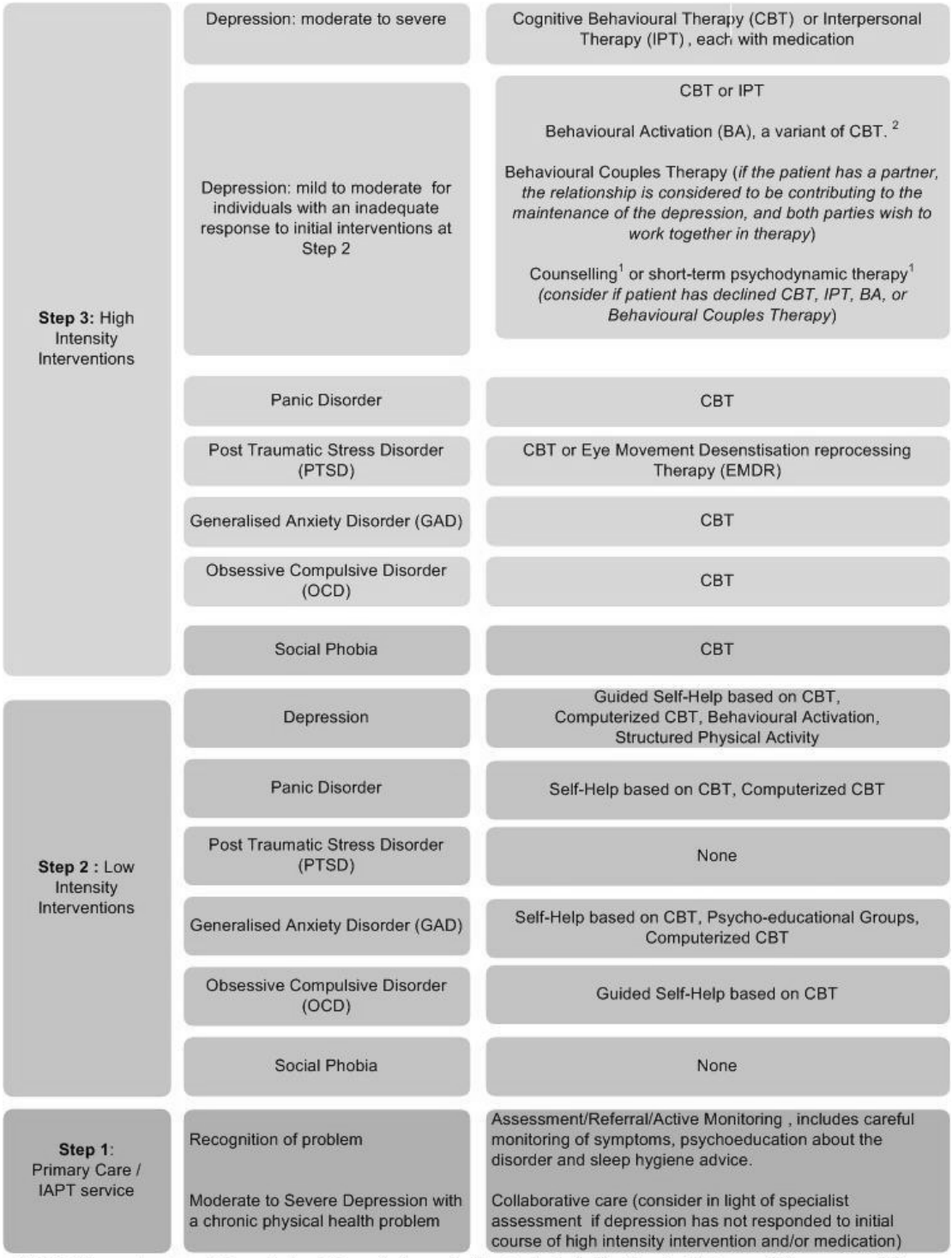

Figure 2. Stepped care model of delivery used by IAPT services. (Department of Health [DoH], 2007).

2.2 Personality Disorder

The current International Classification of Diseases, 10th edition (ICD-10; World Health Organization, 2004) describes several categories of personality disorders (see Figure 2). Once general criteria for personality disorders are met, further clinical information is gathered in order to identify the most appropriate subtype for diagnosis.

General Criteria for a Personality Disorder

A. Evidence that the individual's characteristic and enduring patterns of inner experience and behaviour deviate markedly as a while from the culturally accepted range (or 'norm'). Such deviation must be manifested in more than one of the following areas:
    1) Cognition (i.e. ways of perceiving and interpreting things, people and events; forming attitudes and images of self and others);
    2) Affectivity (range, intensity, liability, and appropriateness of emotional arousal and response)
    3) Control over impulses and need gratification;
    4) Relating to others and manner of handling interpersonal situations.

B. The deviation must manifest itself pervasively as behaviour that is inflexible, maladaptive, or otherwise dysfunctional across a broad range of personal and social situations (i.e. not being limited to one specific 'triggering' stimulus or situation).

C. There is personal distress or adverse impact on the social environment, or both, clearly attributable to the behaviour referred to under B.

D. There must be evidence that the deviation is stable and of long duration, having its onset in late childhood or adolescence.

E. The deviation cannot be explained as manifestations or consequence of other adult mental disorders, although episodic or chronic conditions from sections F0 to F7 of the ICD-10 classification may co-exist, or be superimposed on it.

F. Organic brain disease, injury or dysfunction must be excluded as possible causes of the deviation (if such organic cause is demonstrable, use category F07).

Figure 3. ICD-10 general classification of Personality Disorders (World Health Organization, 2004).

Personality disorders appear to be quite common, with varying prevalence rates within the literature, depending on the sample population. Research studies have typically recruited patients from secondary and tertiary level services due to higher prevalence levels (Keown et al., 2002; Merson et al., 2002; Ranger et al., 2006).

Within community samples between 5-13% prevalence rates have been found (Casey & Tyrer, 1986; Coid, Tyrer, Yang, et al., 2006; Grant, Hasin, Stinson, et al., 2004; Torgersen, Kringlen & Cramer, 2001). Moran, Jenkins, Tylee, Blizard and Mann (2000) found 24% of primary care attendees met diagnosis for personality disorder. Epidemiological studies suggest 40-52% of patients in community mental health teams (CHMT) have a diagnosis of personality disorder (Keown, Holloway, Kuipers, 2002; Merson, Tyrer, Onyett, et al., 2002), 44% of psychiatric inpatients (Cutting, Cowen, Mann & Jenkins, 1986), rising steeply to between 70-92% in tertiary psychiatric services and prisons (Fazel & Danesh, 2002; Ranger, Methuen & Rutter 2004).

Patients with personality disorders are likely to meet diagnostic criteria for more than one personality disorder. Keown et al. (2002) found 52% of patients in a CHMT met criteria for more than one personality disorder. Furthermore, research evidence has shown that personality disorders are highly co-morbid with other Axis I psychiatric diagnoses. In their study Keown et al. (2002) found personality disorders to be co-morbid with psychotic and affective disorders. In a multi-site study of chronic depression, Keller, Gelenberg, Hirschfeld et al., (1998) found that 51% of the sample population had a co-morbid personality disorder. Poorer treatment outcomes are associated with Axis I disorders in the presence of personality disorders (Newton-Howes, Tyrer & Johnson, 2006). Reich & Vasile (1993) found that treatment of depression was less successful when there was evidence of a personality disorder.

Personality disorders are associated with significant burden on the individual, their family and on the wider society. There has been some research examining the economic cost of personality disorder. Some studies suggest that patients with personality disorder access psychiatric services excessively in comparison

to other clinical populations (Saarento, Nieminten, Hakko, et al., 1997; Seivewright, Tyrer, Casey, et al., 1991). However, other studies suggest that patients with personality disorder are less likely to contact services compared to patients with depression (Andrews, Issakidis & Carter, 2001). Rendu, Moran, Patel, Knapp and Mann (2002) examined the economic impact of personality disorder in the UK health service. Rendu et al., (2002) found costs for patients with personality disorder were significantly higher with a co-morbid common mental health disorder. One way of reducing the associated economic costs could be the use of primary care services, rather than the use of more specialist services which would incur greater costs.

2.3 Personality Disorder within Talking Therapy Services

In February 2011 the Department of Health (DoH) published a four year plan of action (Talking Therapies: A four year plan of action, 2011) for Talking Therapy services, such as SPTS. In this document DoH discuss the need for local commissioners and providers of services to realise the benefits of talking therapies for individuals with severe mental illness, such as personality disorder. DoH suggested that appropriate care pathways are needed to ensure that talking therapy services are available to these individuals.

Furthermore, the DoH publication, Recognising Complexity: Commissioning guidance for personality disorder (Department of Health, July 2009) highlights the importance of commissioning services across all levels of the healthcare system, as specialist personality disorder services alone are unable to meet the needs of all individuals. The guidelines suggest that commissioners should ensure that primary care services are able to identify individuals with personality disorders in order to provide the most appropriate treatment within the service. At the same time, individuals with more serious problems should be recognised and referred on to other services. By identifying this at the triage/assessment stage, patients could be seen more quickly within the most appropriate service, whether this is SPTS or another service. This would help prevent delays in patients starting treatment.

Furthermore, the epidemiological evidence has highlighted the need to screen for patients with personality disorders as studies have shown varying

prevalence rates of personality disorder within primary care populations. Moran (2002) describes 20% prevalence rate in his study whilst Parsons (1997) found a borderline personality disorder prevalence rate of 18.5% amongst attendees of primary care health services. These studies demonstrate the need to screen for personality disorders within primary services, as such factors can impact the development of a therapeutic relationship and subsequent engagement with therapy. Furthermore, research has shown that there are poorer treatment outcomes associated with the presence of personality disorders. Identifying the presence of personality disorders will help to ensure that patients are seen within the most appropriate services.

2.4 Current Assessment Process in SPTS

In September 2011 SPTS was not using any measures of personality disorder in their screening process. During the assessment process clinicians were using clinical judgement in collaboration with information from standardised measures (GAD-&, PHQ-9) and the minimum IAPT dataset. This information was used to decide whether the referral should be accepted by the service, and if accepted, which step and intervention allocation would be most appropriate.

2.5 Incorporating a Personality Disorder Measure within SPTS' assessment

The Standardised Assessment of Personality – Abbreviated Scale (SAPAS; Moran, Leese, Lee, Walters, Thornicroft, & Mann, 2003) was identified as an appropriate screening measure within SPTS for personality disorder. Initially a structured interview, the SAPAS was further adapted into a self report measure (Germans, Van Heck, Moran & Hodiamont, 2008). The self-report version of the SAPAS consists of eight items and is simple to use (see Appendix A).

The SAPAS aims to produce a dimensional score representing the likelihood that an individual has a personality disorder in general, rather than screening for specific types of personality disorders. Completion of the SAPAS produces a score ranging from 0 to 8. The SAPAS is a brief measure, taking no more than five minutes to complete. This makes it a feasible addition to SPTS' opt-in questionnaires, when patients are asked to complete a range of questionnaires and forms in order to 'opt-in' to access the service (see Section 2.5 SPTS' new

assessment process). Consequently, a lengthy personality disorder measure would be inappropriate, placing additional burden on the patient, possibly leading to non-completion.

In the original study, Moran et al. (2003) validated the use of the SAPAS using a general psychiatric population. A score of 3 or more on the SAPAS correctly identified the presence of personality disorder, validated using the Structured Clinical Interview for the DSM IV, in 90% of the patients. Using this cut-off score of 3 on the SAPAS, good sensitivity and specificity values were found (0.94 and 0.85 respectively) suggesting that the SAPAS displays good psychometric properties.

The SAPAS has been validated using a sample of patients with substance dependency (Hesse & Moran, 2008). The SAPAS correlated highly with Cluster A (paranoid and schizoid) and Cluster C (avoidant, dependent and obsessive-compulsive) criterion for personality disorders. Germans et al., (2008) found using the SAPAS as a self-report did not adversely affect the specificity and sensitivity of the measure (0.83 and 0.80 respectively), although the values were somewhat lower than those found by Moran et al., (2003). The authors suggested that the variance in specificity and sensitivity scores maybe attributable to differences in prevalence and severity rates of personality disorders within the Danish population.

It was proposed that the SAPAS would be incorporated into SPTS' new initial assessment screening process.

2.6 SPTS new initial assessment screening process

SPTS new assessment process involves individuals receiving an opt-in pack following their referral, which they are required to complete and return to the service. Once the opt-in pack is received by SPTS it is triaged by a team leader. Using the contents of the opt-in pack, including scores on the various measures, usually supplemented by a telephone call, individuals are allocated to either LI or HI therapy.

The initial assessment packs are composed of the following questionnaires: Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer & Williams, 2001), Generalised Anxiety Disorder Assessment (GAD-7; Spitzer, Kroenke, Williams & Lowe, 2006), Work and Social Adjustment Scale (W&SAS; Mundt, Marks, Shear & Greist, 2002), Psychiatric Diagnostic Screening Questionnaire (PDSQ; Zimmerman and Matthia, 2001), IAPT phobia scales and SAPAS questionnaire. Further information relating to the clinical cut-off points for these measures can be found in Appendix B.

As well as the above measures, patients are asked about their employment status and required to complete a registration form collecting demographic information.

3. Aims of this Service Evaluation Project

This service evaluation project planned to evaluate the pilot use of the Standardised Assessment of Personality – Abbreviated Scale (SAPAS) questionnaire as part of the standard initial assessment in SPTS.

The current assessment process in SPTS involves the use of clinical judgement and a range of measures (GAD-7, PHQ-9, W&SAS) to determine the presence of any personality difficulties. This decision affects allocation to either LI or HI therapy. There is currently no personality disorder screening measure incorporated into this process. By using an additional screening questionnaire the service would like to explore whether scores can predict allocation to LI or HI therapists and subsequent engagement with the service The SAPAS will be used alongside the existing measures – GAD 7 and PHQ 9 during the initial assessment process.This will provide preliminary information to help SPTS evaluate whether the service is meeting the needs of individuals with personality difficulties when presenting with symptoms of anxiety or depression.

This project seeks to understand the allocation of individuals with personality difficulties in SPTS and their subsequent engagement with the service. This overall aim of the project will be explored through the following objectives;

1) Understand likely prevalence of personality disorder in the SPTS patient population by looking at associations between basic demographic information (e.g. age, gender and ethnicity) from IAPTUS (information system used by SPTS) and scores on the SAPAS questionnaire using descriptive statistics. This will help to establish whether there are any factors which are associated with higher or lower SAPAS scores.

2) Moran et al (2003) established that a cut-point of 3 on the SAPAS produces a good balance of sensitivity and specificity for the identification of personality disorder. The data will be examined in order to explore the relationship between SAPAS score and treatment allocation.

3) Exploring the relationship between SAPAS scores and engagement with SPTS. This will provide some preliminary data about how SAPAS scores

may affect engagement with the service and whether this varies depending on treatment allocation.

Henceforth, for ease of reading, SAPAS scores of 2 and below will be referred to as low SAPAS scores and SAPAS scores of 3 and above will be referred to as high SAPAS scores.

4. Methodology

4.1 Data Collection

Data was extracted from the IAPTus patient database, an online, password protected system used by clinicians to record patient data. Data for patients' initial assessments are entered onto IAPTus as routine procedure. Weekly IAPT measures are entered by therapists, in line with national guidelines. Copies of all initial assessments were already uploaded to IAPTus from where SAPAS scores were retrieved.

4.2 Data Analysis

Using the reporting system, a subset of data was generated using the following parameter:

- Completed an initial SPTS assessment between 31st January 2012 and 31st March 2012. This three month time period was used, as although SPTS had started rolling out their new assessment procedure in December 2011, this has not been fully achieved until January 2012.

The report was generated as a Microsoft Excel spread sheet. As SAPAS scores were a recent addition to SPTS' assessment procedure these scores were not recorded in a specific field on IAPTus. Instead, the completed initial assessment forms were uploaded onto the 'Documents' section of the system by an administrator within the service. It was necessary to look up each patient included on the generated report on IAPTus in order to calculate their SAPAS score. This score was then added to the Excel spread sheet containing their other details.

Whilst completing the task of retrieving and scoring each patient's SAPAS score it became evident that a number of individuals would need to be excluded from the analysis. This was due to a number of reasons; individual not completing the new opt-in questionnaires, individuals only partially completing the opt-in questionnaires, no opt-in questionnaires being available for a patient, patients being accepted to the service using the previous referral pathway (self or GP referral form) or other missing data. Unfortunately, details of the number of patients excluded for each specific aforementioned reason was not recorded.

However, this did lead to a reduced number of patients (n= 178) being eligible for inclusion in this project. Figure 3 outlines this in further detail.

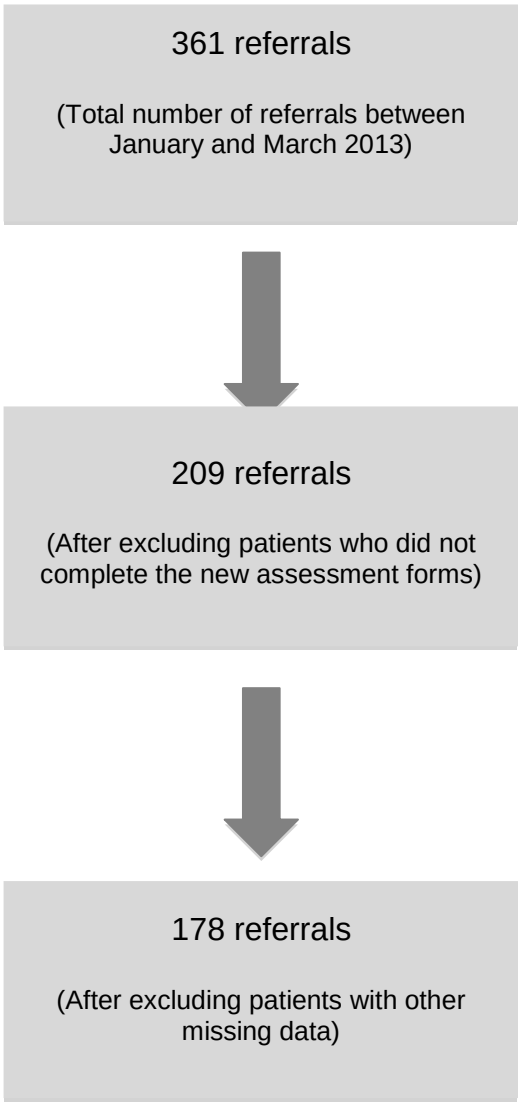

Figure 4. Data flowchart.

Following recording of SAPAS scores, each patient's allocation to therapy was recorded on the Excel spread sheet. This was determined by looking at the patient's 'Care Pathway' tab on IAPTus. Table 1 shows the codes used to record patient's allocation to therapy and the associated frequencies associated with each allocation code.

Table 3. Codes used to show patient's allocation to therapy

Code	Allocation	Frequency	Percentage
1	Allocated to High Intensity therapy in SPTS	78	43.8
2	Allocated to Low Intensity therapy in SPTS	85	47.8
3	Decided that no longer wanted treatment in SPTS	2	1.1
4	Allocated to group intervention in SPTS	13	7.3
Total		178	100%

Once patients' SAPAS scores were recorded on the Excel spread sheet, it was necessary to code engagement in therapy. This was determined by the author by classifying patients as either engaged, did not engage or not appropriate. Each of these categories encapsulated further sub-categories, which can be seen in Table 2. Engagement with the therapist was based on stage in the care pathway in October 2012. This was felt to be long enough for patients to have at least had the opportunity to engage in therapy, enabling preliminary exploration of therapy outcomes for this project. Patients were defined as having engaged in therapy if they were currently in treatment, awaiting treatment or being discharged following the completion of treatment. Patients were classified as not engaging with therapy if they had been coded as 'failed to engage' or 'dropped out' on IAPTus by individual therapists. This does not take into account the number of attended and non-attended sessions, and was found to vary between patients with some patients not attending after one session and others not attending after several sessions.

Table 4. Defining patient's engagement with their allocated therapist

Code	Description	Frequency	Percentage
Engaged	- In HI treatment	32	18.0
	- In LI treatment	12	6.7
	- Completed HI treatment, stepped down to LI	1	0.6
	- Completed LI treatment, stepped up to HI	16	9.0
	- Discharged following HI treatment	19	10.7
	- Discharged following LI treatment (including groups and workshops)	22	12.4
	- On waiting list for HI treatment	7	3.9
Sub-total		**109**	**61.3**
Did not engage	- Discharged from SPTS after not attending LI therapy appointment	41	23.0
	- Discharged from SPTS after not attending HI therapy appointment	19	10.7
	- Allocated to LI intervention but decided no longer wanted treatment	3	1.7
	- Allocated to HI intervention but decided no longer wanted treatment	2	1.1
Sub-total		**65**	**36.5**
Not appropriate	- Allocated to LI intervention but referred on to another service	2	1.1
	- Allocated to HI intervention but referred on to another service	2	1.1
Sub-total		**4**	**2.2**
Total		178	100%

Once all the above additional information (SAPAS score, allocation to therapist and engagement with therapist) was added to the report generated in IAPTus, this was considered to be the master data file. This Excel spread sheet was then imported into SPSS to enable statistical analyses to be completed. It should be noted that the mean scores were based on patients' scores from their initial assessment questionnaires.

4.3 Final data sample

There was a final sample of 178 patients, following the process of data analysis described in section 4.2. Of these 178 patients, 64% were female and 36% were male. The main sources of referrals for this sample were GPs (86.5%), followed by Other Service/Agencies (8.4%), Self referrals (3.9%) and, finally, Health Visitors (1.1%). Table 3 shows the breakdown of the patients' ethnicities in the final data sample.

Table 5. Breakdown of patients according to ethnicity

Ethnicity	Frequency	Percentage
British	85	54.1
Any other White background	42	26.7
Irish	6	3.9
Black British	13	8.3
Any other mixed background	3	1.9
Any other Asian background	3	1.9
White & Black	2	1.3
Indian	2	1.3
Bangladeshi	1	0.6
Not available on IAPTus (excluded from %)	21	-
TOTAL	178	100%

The histogram in Figure 4 shows the age distribution of this sample of patients. Within this audit sample, the majority of patients were aged between 16 and 55 years. There were fewer people over the age of 60 referred to the service between January and March 2012 who had correctly completed all the assessment questions. However this is to some extent likely to be a reflection of the Southwark borough, which had a relatively large proportion of working age residents in the 2011 Census survey (Office for National Statistics, 2011).

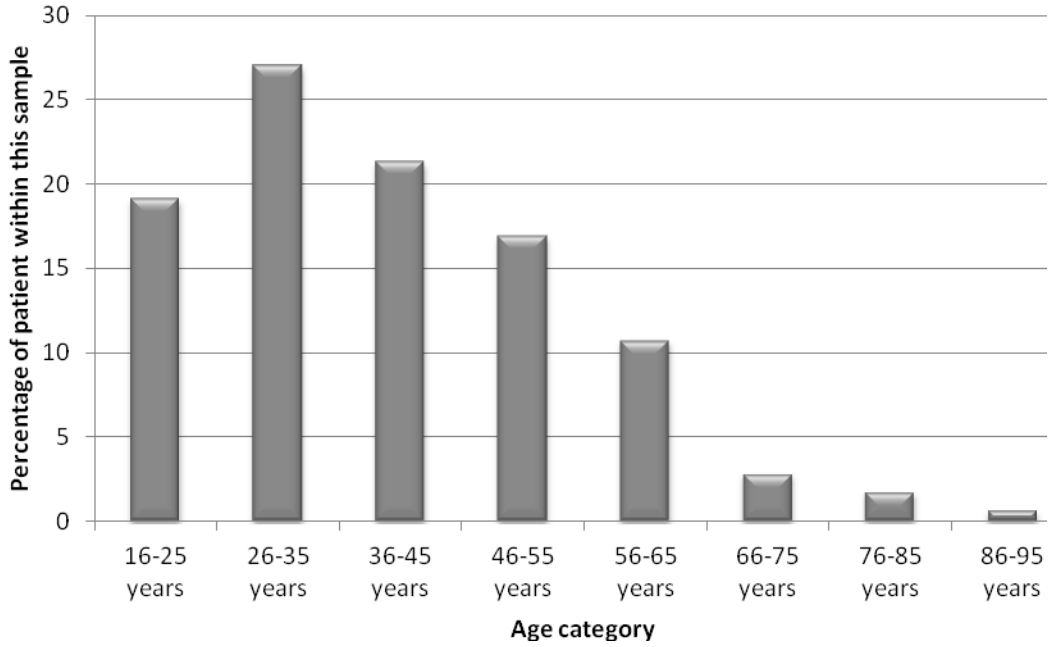

Figure 5. Percentage of referrals by age.

IAPTus allows therapists to record provisional diagnoses for patients. Percentages of the recorded diagnoses can be seen in Figure 6. Unfortunately, for a number of patients (n = 90) a provisional diagnosis had not been recorded.

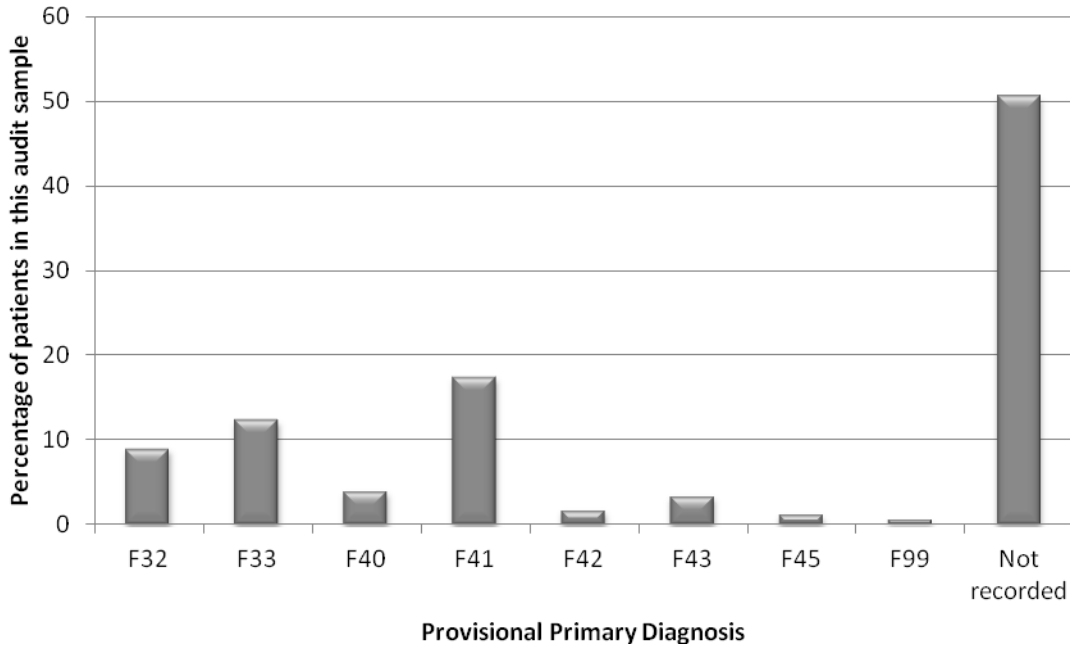

Figure 6. Provisional primary diagnoses recorded by therapists.[2]

The most frequently recorded provisional diagnoses were F41- Other anxiety disorder (17%) and F33- Major Depressive disorder, recurrent (13%). However, these figures should be interpreted with caution because as stated above, provisional diagnoses were not recorded for a significant proportion of this sample.

[2] Diagnoses as recorded along the x-axis: F32 = Major Depressive Disorder, single episode; F33= Depressive episode, recurrent; F40 = Phobic anxiety disorders; F41 = Other anxiety disorder; F42 = Obsessive Compulsive Disorder; F43 = Reaction to severe stress, and adjustment disorders; F45 = Somatoform disorder; F99 = Mental disorder not otherwise specified.

5. Results

This project aimed to understand the allocation of individuals with personality difficulties in SPTS and their subsequent engagement with the service. In particular, whether SAPAS score can predict allocation to step 2 (low intensity) or step 3 (high intensity) therapy and subsequent engagement using the following objectives:

1) Exploring associations between basic demographic information (e.g. age, gender and ethnicity) and scores on the SAPAS questionnaire using descriptive statistics.
2) Exploring the relationship between treatment allocation and SAPAS score.
3) Exploring the relationship between engagement with SPTS and SAPAS score.

The mean SAPAS score for this sample population (n = 178) was 3.76 (SD = 1.81). Figure 6 illustrates the percentage of patients for each SAPAS score. The highest percentage of patients had a SAPAS score f 4.

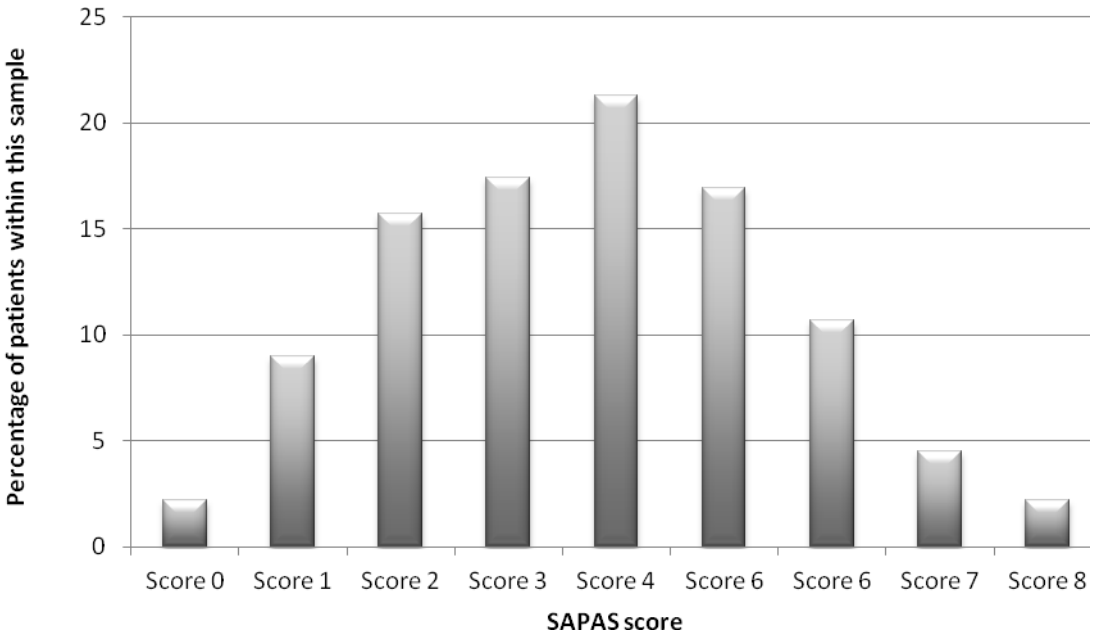

Figure 7. Frequency histogram of SAPAS scores.

For convenience, findings will be reported with reference to each of the three objectives described above.

5.1 Associations between demographic information and SAPAS scores

Below are a range of histograms and statistical analyses comparing patients with a SAPAS score of 2 and below and SAPAS scores of 3 and above based on different demographic variables. This cut off point was established by Moran et al (2003) who found that a score of 3 on the SAPAS produced a good balance of sensitivity and specificity for the identification of personality disorder. 48 patients had a SAPAS score of 2 or below, whilst 130 patients had a SAPAS score of 3 and above. The demographic profile of these two groups, based on their SAPAS scores will be explored in further detail in this section.

5.1.1 Gender and SAPAS scores

Before exploring the data in terms of low and high SAPAS scores, Figure 7 was produced to look at the gender profile across the different SAPAS scores. Similar percentages of male and female patients within each SAPAS score can be seen in Figure 7.

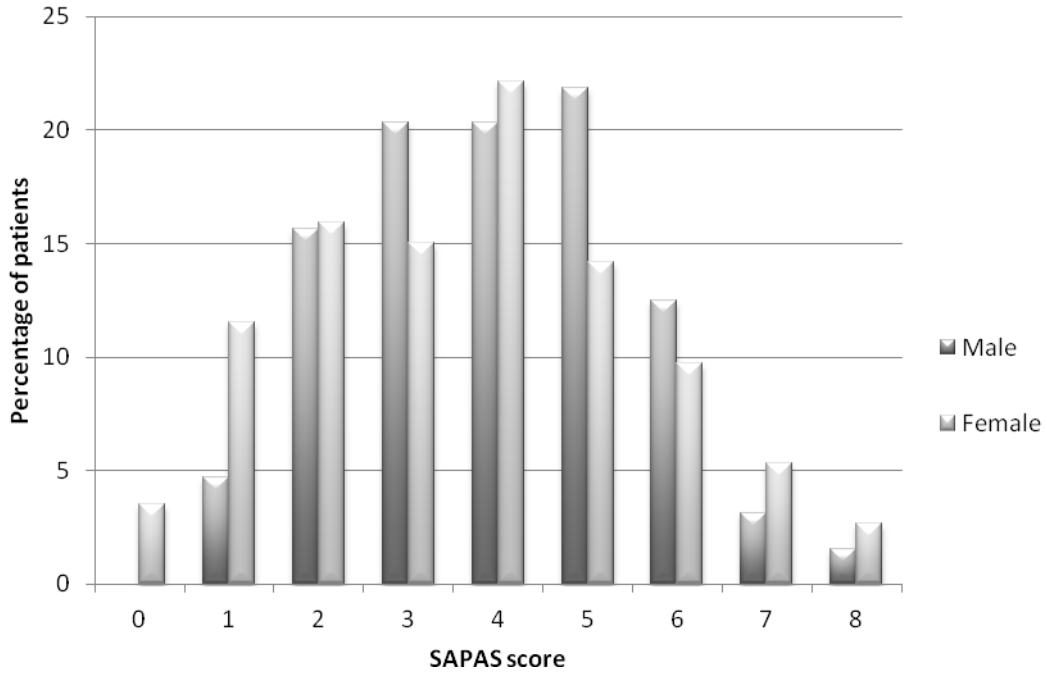

Figure 8. Comparison of SAPAS scores by gender.

The descriptive statistics for gender and SAPAS score are described in Table 4. For both genders, there were a larger number of patients with a high SAPAS score.

Table 6. Descriptive statistics for gender and SAPAS scores.

Gender	n	Low SAPAS score (% of patients)	High SAPAS score (% of patients)	Mean (sd)
Male	64	27.0	39.2	3.97 (1.60)
Female	113	73.0	60	3.65 (1.93)
Total	177	100	99.2	-

A chi-square analysis found no association between gender and high/low SAPAS score (x^2 (1) = 2.35, p = 0.13).

5.1.2 Age category and SAPAS scores

Percentages of low and high SAPAS scores within each age category can be seen in Table 5. A similar age distribution for both groups of patients (high and low SAPAS scores) can be observed in the bar-chart.

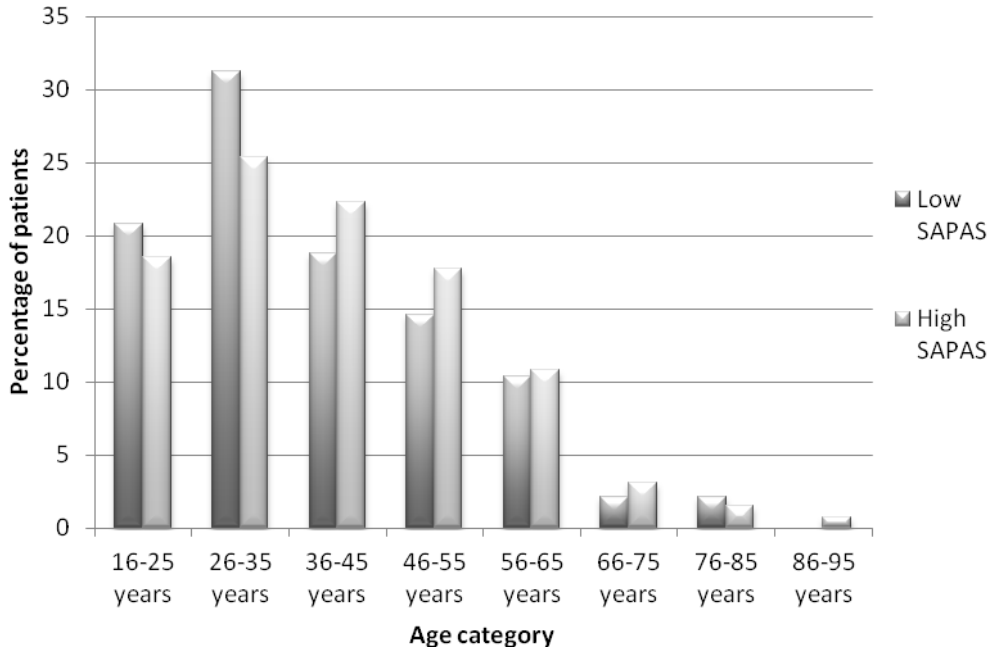

Figure 9. Comparison of SAPAS scores by age categories.

Descriptive statistics for SAPAS scores and age categories are shown in Table 5. A correlational analysis was completed in order to explore the relationship between age and SAPAS score. There was a no relationship between age and SAPAS score, r = -0.09, p = 0.22 (two-tailed).

Table 7. Descriptive statistics for age category and SAPAS score.

Age Category	Total n	Low SAPAS score n	(%)	High SAPAS score n	(%)	Mean(sd)
16 - 25 years	34	10	29.4	24	70.6	4.0 (1.97)
26 – 35 years	48	15	31.3	33	68.7	3.8 (1.99)
36 – 45 years	38	9	23.7	29	76.3	3.9 (1.66)
46 – 55 years	30	7	23.3	23	76.7	3.7 (1.69)
56 – 65 years	19	5	26.3	14	73.7	3.3 (1.60)
66 – 75 years	5	1	20	4	80	3.0 (1.41)
76 – 85 years	3	1	33.3	2	66.7	3.7 (3.06)
86 – 95 years	1	0	0	1	100	4.0 (n/a)
Total	178	48	-	130	-	-

5.1.3 Ethnicity and SAPAS scores

As can be seen in Table 6, the majority of patients, within low and high SAPAS scores, described their ethnicity as British (60%). However, it should be noted that ethnicity was not recorded for all patients.

Table 8. Descriptive statistics for ethnicity and SAPAS score.

Ethnicity	n	Low SAPAS score (% of patients)	High SAPAS score (% of patients)	Mean (sd)
White British	85	60.4	43.1	3.6 (1.87)
Irish	6	6.2	2.3	3.0 (2.19)
Any other white background	42	14.6	26.8	3.9 (1.61)
Caribbean	13	4.2	8.5	4.4 (1.94)
White & Black Caribbean	2	2.1	0.8	3.5 (3.54)
Any other mixed background	3	4.2	0.8	1.7 (1.16)
Indian	2	2.1	0.8	3.0 (2.9)
Bangladeshi	1	0	0.8	5.0 n/a)
Any other Asian background	3	0	2.3	3.7 (1.16)
Not recorded	21	6.2	13.8	4.2 (1.67)
Total	178	100	100	-

A chi-square analysis was used to explore whether there was a significant association between ethnicity (White British and Any other background) and SAPAS score (high/low). A non-significant association was found, x^2 (1) = 2.69, p =0.10 suggesting that there was no association between ethnicity and SAPAS score.

5.1.4 PHQ-9, GAD-7, & W&SAS scores and SAPAS scores

Correlation analyses were completed in order to explore the relationships between scores on the various IAPT outcome measures (GAD-7, PHQ-9 and W&SAS) and the SAPAS. The results of these analyses can be seen in Table 7.

Table 9. Correlations between GAD-7, PHQ-9, W&SAS and SAPAS.

Outcome measure	*r*	*p-value*
PHQ-9	0.35	<0.05
GAD-7	0.23	<0.05
W&SAS	0.31	<0.05

Significant correlations were found between scores on the different IAPT outcome measures and SAPAS scores. The analyses was extended further to look at whether there were differences between low and high SAPAS scoring patients on the PHQ-9, GAD-7 and W&SAS measures. Table 8 summarises patients' mean scores on the various questionnaires, depending on whether they had a low or high SAPAS score. High mean scores for the high SAPAS score group were observed across all three measures (PHQ-9, GAD-7 and W&SAS).

Table 10. Summary of Independent samples t-tests results comparing scores on PHQ-9; GAD-7; W&SAS depending on SAPAS score.

Measure	SAPAS score ≤2 Mean (SD)	SAPAS score ≥3 Mean (SD)	t (df=176)	p (two-tailed)
PHQ-9	10.42 (6.09)	15.54 (6.38)	-4.81	0.000
GAD-7	10.35 (5.73)	12.76 (5.11)	-2.70	0.008
W&SAS	13.33 (8.11)	18.15 (8.57)	-3.37	0.001

Independent samples t tests were performed comparing patients scores on the PHQ-9, GAD-7 and W&SAS, based on whether their SAPAS score was ≤2 or ≥3. The results showed that there was a significant difference between high and low SAPAS scores on the PHQ-9, GAD-7 and W&SAS.

5.2 Relationship between treatment allocation and SAPAS scores

Table 9 shows the interventions offered to patients with high and low SAPAS scores.

Table 11. Comparison of interventions offered depending on SAPAS scores.

Type of Intervention	SAPAS score ≤2 (% of patients)	SAPAS score ≥3 (% of patients)
High Intensity therapy	35.4	46.9
Low Intensity therapy	54.2	45.4
Group treatment	2.1	6.9
Decided to no longer pursue treatment from SPTS	8.3	0.8

Table 9 shows that a higher percentage of patients with a low SAPAS score were allocated to a LI therapist (54.2%). In contrast, a higher percentage of patients with a high SAPAS score were offered HI therapy (46.9%). This would suggest that a lower SAPAS score is more likely to result in a LI therapy allocation whereas a higher SAPAS scores would be more likely to result in a HI therapy allocation. It is interesting to note that a greater proportion of patients with a low SAPAS score decided they no longer wished to pursue treatment at SPTS following their initial screening assessment. However only limited information could be found using percentages to compare interventions offered based on SAPAS scores.

A stepwise binary logistic regression analysis was conducted to predict the amount of variance in therapist allocation (HI or LI) using scores on the SAPAS, PHQ-9, GAD-7, WS&AS, age or gender as potential predictors. Gender was specified as being a categorical variable. Patients allocated to group treatment or those who were not appropriate for the service were excluded from the analysis.

A test of the full model against a constant only model was statistically significant, indicating that the predictors, scores on SAPAS and PHQ-9, reliably distinguished between allocation to either HI or LI (chi square = 12.32, p <0.05 with df = 2). This can be seen in Table 10, SAPAS score (p = 0.041) and PHQ-9 score (p = 0.045), as demonstrated by the Wald criterion. All other predictors were non-significant. Nagelkerke's R^2 of 0.097 indicated a weak relationship between the predictors and therapist allocation. Prediction success overall was 65% (60.3% for HI and 69.4% for LI).

Table 12. Summary of results of logistic regression looking at therapist allocation.

Predictor variable	B	S.E.	Wald	Sig.	Exp(B)
SAPAS score	-0.19	0.10	4.19	0.041	0.82
PHQ-9 score	-0.05	0.03	4.01	0.045	0.95
Constant	1.59	2.1	10.95	0.001	4.88

The logistic regression analysis suggests that there is a relationship between therapist allocation and SAPAS score. The results of the logistic regression showed that the SAPAS score and PHQ-9 score helped to predict therapist allocation, with the other variables not adding anything to the prediction model.

5.3 Relationship between engagement with SPTS and SAPAS scores

For the purpose of this study 'engagement' was defined using a series of codes (see Table 2, page 21). Using these codes engagement was operationally defined, with three levels – engaged, did not engage and not appropriate. 61.3% of the study sample were considered engaged in therapy (n=109), 36.5% not engaged (n=65) and 2.2% not appropriate for the service.

Table 11 compares the engagement of patients with high SAPAS scores and low SAPAS scores, using the engagement codes described in Table 2.

Table 13. Comparing engagement with therapist in SPTS depending on SAPAS score.

Code	Description	SAPAS ≤2		SAPAS≥3	
		n	(%)	n	(%)
Engaged	- In HI treatment	7	14.6	25	19.2
	- In LI treatment	2	4.2	10	7.7
	- Completed HI treatment, stepped down to LI	0	0.0	1	0.8
	- Completed LI treatment, stepped up to HI	5	10.4	11	8.5
	- Discharged following HI treatment	6	12.5	13	10.0
	- Discharged following LI treatment (including groups and workshops)	9	18.8	13	10.0
	- On waiting list for HI treatment	2	4.2	5	3.8
Sub-total		**31**	**64.7**	**78**	**60.0**
Did not engage	- Discharged from SPTS after not attending LI therapy appointment	12	25.2	29	22.3
	- Discharged from SPTS after not attending HI therapy appointment	2	4.2	17	13.1
	- Allocated to LI intervention but decided no longer wanted treatment	1	2.0	2	1.5
	- Allocated to HI intervention but decided no longer wanted treatment	1	2.0	1	0.8
Sub-total		**16**	**33.4**	**49**	**37.7**
Not appropriate	- Allocated to LI intervention but referred on to another service	1	2.1	1	0.8
	- Allocated to HI intervention but referred on to another service	0.0	0.0	2	1.5
Sub-total		**1**	**2.1**	**3**	**2.3**
Total		**48**	**100**	**130**	**100**

Table 11 provides an interesting preliminary summary of data extracted from IAPTus regarding patient engagement with their therapist, depending on therapy intensity and SAPAS score. One noteworthy finding is the comparison of non-attendance patterns of patients with high and low SAPAS scores. There appears to be rather similar percentages of patients discharged from SPTS following non-attendance of LI appointments.

Table 12 shows a breakdown of patients in therapy and discharged patients. It is interesting to note that there were a greater number of patients with a high SAPAS score still in therapy.

Table 14. Comparison of patients in therapy and discharged from therapy.

Position in therapy	Low SAPAS score		High SAPAS score		Total n
	n	%	n	%	
In therapy	14	23.0	47	35.0	61
Discharged	14	77.0	26	65.0	40

A chi-square analysis was used to explore whether there was a significant association between SAPAS score (high/low) and patients position in therapy (in therapy or discharged). A non-significant association was found, x2 (1) = 1.75, p = 0.19 suggesting that there was no association between SAPAS score and whether a patient was still in therapy or not.

A stepwise binary logistic regression analysis was conducted to explore how much of the variance in engagement (engaged or disengaged) with therapist could be predicted using scores on the SAPAS, PHQ-9, GAD-7, WS&AS, age or gender as potential predictors. A test of the full model against a constant only model was non significant, indicating that none of the predictors made a significant contribution to the predictive power of the model (=13.89, p=0.05 with df = 7).

6. Discussion

6.1. Discussion of Main Findings

This study aimed to explore whether the introduction of a personality disorder screening measure, SAPAS, could predict therapist allocation and subsequent engagement with the therapist. Data from a three-month period from SPTS was analysed. The main findings of the study are discussed in relation to the three objectives.

1) Associations between demographic information and SAPAS scores

Bukh, Bock, Vinberg, Gether and Kessing (2010) used the SAPAS with patients experiencing a first episode of depression in Denmark. 53.3% of the sample achieved a low SAPAS scores and 46.7% of the sample achieved a high SAPAS score. In comparison, the results of this study found that only 27% had a low SAPAS score whilst 73% had a high SAPAS score.

Variability in patient characteristics between the two groups (low and high SAPAS scores) was explored in terms of several demographic variables (gender, age and ethnicity) and scores on IAPT outcome measures. Key findings are summarised below;

- High SAPAS scores were not associated with any particualr age, ethnicty or gender group. However, the small numbers within this sample limit the conclusions that can be drawn from this.
- High SAPAS scores were associated with high scores on the GAD-7, PHQ-9 and W&SAS.

One possible hypothesis for the latter finding could be that the presence of personality disorder issues may lead to increased symptoms of depression and anxiety, or vice versa. This finding correlates with Patience, McGuire, Scott & Freeman (1995), who found that patients scoring more highly on a personality disorder measure (Personality Assessment Schedule, Tyrer, Alexander & Cicchetti et al., 1979) were more likely to be experiencing severe symptoms of depression, as measured on the Hamilton Depression Rating Scale (HDRS) within a primary care setting.

2) Relationship between treatment allocation and SAPAS scores

This objective aimed to explore the relationship between SAPAS score and treatment allocation in order to see whether SAPAS scores could predict treatment allocation. A logistic regression analysis illustrated that only the SAPAS score and PHQ-9 score helped to predict therapist allocation, with other variables (age, gender, W&SAS score and GAD-7 score) not adding to the prediction model. The overall prediction success rate was 68%, with a higher percentage of correct predictions for LI (75%) rather HI allocation (60%). These prediction success figures indicate that the model was a good fit.

Patients with a high SAPAS score were more likely to be offered HI treatment and group treatment. In contrast, patients with a low SAPAS score were more likely to be offered LI treatment. This is what intuitively might be expected to occur; that patients with a higher SAPAS score, suggesting an increased likelihood of the presence of personality disorder issues, would be seen by HI therapists who are able to offer more complex treatments.

These results suggest that therapists are taking factors, other than anxiety and depression symptom scores, into account when deciding allocation to therapy.

3) Relationship between engagement with SPTS and SAPAS scores.

For this objective, engagement was operationally defined with three levels – engaged disengaged and not appropriate, based on codes derived by the author. Using these codes, the findings showed that 61.3% of the patients engaged in therapy, 36.5% did not engage in therapy and 2.2% of the sample were not appropriate for SPTS. However it is important to note that there was a large variance in how non-engagement was defined, in terms of how many sessions were not attended before it was classified as not engaged. Non-engagement varied from a patient not attending following an assessment to patients not attending after several sessions. Despite this caveat, a number of interesting findings were observed.

In order to explore the relationship between engagement with SPTS and SAPAS score a logistic regression was completed. The results of this logistic regression analysis showed that none of the predictor variables (age, gender,

GAD-7, PHQ-9 score, W&SAS score and SAPAS score) helped to predict engagement with the therapist.

Looking at the initial findings of this study showed that patients with a low SAPAS score were more likely to decide that they no longer wished to pursue treatment from SPTS. This could be due to a number of reasons e.g. accessing help elsewhere, deciding that it was no longer a priority for them, other changes in their lives affecting their ability to access the service. However, one possible reason could be that they were unhappy about their allocation of therapy. Exploring reasons for why this subset of patients decided to not continue with treatment at SPTS may provide useful information about what leads patients to drop out from services. The use of quantitative and qualitative methods would provide rich, meaningful information about non-attendance. Such information could help with service development by highlighting factors linked to non-attendance. Identification of such factors could then lead to the development of strategies to help reduce the number of appointments not attended.

The findings also showed that a higher percentage of low SAPAS scoring patients were discharged from SPTS following completion of LI treatment (18.8% for patients with SAPAS score $\leq$2 vs 7.7% for patients with SAPAS score $\geq$3). It would be interesting to gain further information about this group of patients and explore whether engagement changes following completion of LI treatment e.g. does engagement remain the same, increase or decrease. For example, engagement could increase following completion of LI treatment as an individual is stepped up to HI treatment, which may have been their preferential treatment.

Another interesting non-significant finding was found within the subset of engaged patients. A further breakdown of these patients showed that there were a higher number of patients with a high SAPAS score still in therapy. This would be an interesting trend to follow in future studies.

6.2 Limitations

One factor greatly impacting on the study was the small sample size. It is possible that the sample population is not representative of the people typically

referred into SPTS, as a large number of patients were excluded from the analysis due to incomplete questionnaire. This may have impacted on demographical profile of the patients excluded from the analysis e.g. people with reading/writing difficulties may have been refrained from completing the assessment pack due to the number of questionnaires that need to be completed. As such, conclusions of this study need to be considered carefully, as the sample may not be wholly representative of the patients typically seen within SPTS.

The sample size was primarily affected by the SAPAS being a new introduction to the existing SPTS assessment process. The main parameter for inclusion in this study was the completion of an initial SPTS assessment between January 2012 and March 2012, with the new assessment procedure only rolled out in December 2011. Consequently, initial data extraction from IAPTus revealed a large number of patients were referred using the old assessment process. Therefore they had not completed a SAPAS and were excluded from the analysis. Potentially the sample could have been drawn from a later time period, but this would have resulted in an insufficient time period in which to explore engagement with the therapist.

Another limitation of the study was the lack of a robust definition of engagement. Engagement has been a difficult concept to define, with mixed views within the literature. Levy (1988) identified a number of psychological processes, which are implicated in engagement, e.g. empathy, negotiating goals and coping strategies. Gender differences have also been observed in the perception of the engagement process. Watkins, Shaner & Sullivan (1999) found that as well as differences in their perception of engagement, men and women had different needs regarding engagement. In this study, engagement was very much led from the data extracted from IAPTus, where individual therapists coded patient discharges from the service. Unfortunately, the discharges coded on IAPTus did not take into account the number of attended or non-attended sessions. This resulted in large variability, with some patients recorded as discharged after attending several sessions and others after only attending one session.

6.3 Implications for Service Development

This project has yielded some interesting, preliminary findings. The principal finding from this study was that an individual's SAPAS score and PHQ-9 score were the best predictors of allocation to therapist. However, this finding is based on results drawn from the initial 3 months when a new assessment procedure was rolled out in the service. It would be interesting to replicate the methodology used in this study 6 months after the new assessment procedure has been established. This would provide data from a time point when the assessment procedure has been established, thus allowing for a larger sample size and extended data analysis. Furthermore, it would be useful to track patient's engagement with the service over a longer time period to see whether engagement fluctuates over time. This would provide meaningful information for clinicians about when engagement may change, and development of interventions to specifically target poor engagement.

One way of tracking engagement would be the addition of a measure of engagement. This would have several benefits; provide another outcome measure by which to assess treatment outcomes, enable the identification of individuals with poor engagement, which could progress to the development of specific interventions or strategies to increase engagement. One measure of engagement mentioned in the literature is the Service Engagement Scale (SES; Tait, Birchwood & Trower, 2002). This measures engagement from the therapist's perspective, additional measures could be incorporated to look at engagement from the patient's perspective. There are number of avenues that future research regarding engagement within SPTS could focus on e.g. impact of gender, ethnicity, which could then be used to promote engagement.

Looking at non-attendance patterns would also be of great benefit to the service. Of particular benefit would be to explore non-attendance of HI appointments, as there is an increased cost attached to these appointments.

6.4 Conclusions

Patients with high SAPAS scores are just as likely to engage in therapy with SPTS as those patients with lower scores. Patients with low SAPAS scores were more likely to be allocated to low intensity therapy and patients with high

SAPAS score more likely to be allocated to high intensity therapy. This may account for why patients with high SAPAS scores are just as likely to engage in therapy. Allocation decisions in SPTS are based on more than depression and anxiety symptom scores, and one factor would appear to the presence of personality disorders.

Exploring the subset of engaged patients showed that there were a higher number of patients with a high SAPAS score still in therapy. This would be an interesting trend to follow in future studies, in order to investigate whether SAPAS scores impact on the length of treatment, rather than allocation to therapist or engagement with SPTS.

Engagement with therapist was a difficult concept to explore in this study, partly limited by how engagement was defined within this study. To obtain meaningful data that will facilitate service development, a more robust measure of engagement is required. This would involve either having a service wide definition of how non-engagement is coded on IAPTus or controlling for the number of sessions attended and not attended in future studies. Engagement could be extended by the addition of a measure of engagement completed by the patient.

On the whole, these findings suggest that therapists are able to successfully complete treatment with patients in the presence of a personality disorder. Such findings would advocate that patients with personality disorders can be seen in primary care services such as SPTS. However, this conclusion is based on the findings of one study and as such would benefit from other studies using a similar methodology exploring the same issues. It would be prudent for future research to focus on the subset of patients with high SAPAS scores who fail to attend appointments, and explore their reasons for doing so. Addressing these factors by the use of specific interventions and/or strategies may have a positive effect on services such as SPTS by reducing non-attendance and lost resources.

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Appendices

Appendix A - Standardised Assessment of Personality – Abbreviated Scale (SAPAS)

Standardised Assessment of Personality – Abbreviated Scale

Only circle Y (yes) (or N (no) in the case of question 3) if the patient thinks that the description applies *most of the time* and *in most situations*.

1. In general, do you have difficulty making and keeping friends?

   ..... Y/N *(yes=1, no=0)*

2. Would you normally describe yourself as a loner?

   ..... Y/N *(yes=1, no=*0)

3. In general, do you trust other people?

   ..... Y/N *(yes=0, no=*1)

4. Do you normally lose your temper easily?

   ..... Y/N *(yes=1, no=*0)

5. Are you normally an impulsive sort of person?

   ..... Y/N *(yes=1, no=*0)

6. Are you normally a worrier?

   ..... Y/N *(yes=1, no=*0)

7. In general, do you depend on others a lot?

   ..... Y/N *(yes=1, no=*0)

8. In general, are you a perfectionist?

   ..... Y/N *(yes=1, no=0)*

Appendix B – Further information on measures used in SPTS initial assessment screening process

Patient Health Questionnaire (PHQ-9); Kroenke, Spitzer & Williams (2001). The PHQ-9 is based on the diagnostic criteria for Major Depressive Disorder in the DSM IV. It consists of nine items used to measure depression symptomatology. Scores range from 0 to 27. The PHQ-9 provides a depression severity index score as follows;

- 0 – 4 = No depression symptoms present
- 5 – 9 = Symptoms of Mild depression present
- 10 – 14 = Symptoms of Moderate depression present
- 15 – 19 = Symptoms of Moderately severe depression present
- 20 – 27 = Symptoms of Severe depression present

The recommended cut-off for the PHQ-9 severity index is a score of 9. An individual scoring 10 or above can be considered to be suffering from clinical significant symptoms of depression, and described as meeting 'caseness' for depression.

Generalised Anxiety Disorder Assessment (GAD-7); Spitzer, Kroenke, Williams, & Lowe (2006).

The GAD-7 measures symptoms of anxiety. Scores range from 0 to 21. The GAD-7 provides an index score as follows;

- 0 – 4 = No symptoms of anxiety present
- 5 – 10 = Symptoms of Mild anxiety present
- 11 – 15 = Symptoms of Moderate anxiety present
- 16 – 21 = Symptoms of Severe anxiety present

The recommended cut-off for the GAD-7 severity index is a score of 7. An individual scoring 8 or above can be considered to be suffering from clinical significant symptoms of anxiety, and described as meeting 'caseness' for anxiety.

Work & Social Adjustment Scale (W&SAS); Mundt, Marks, Shear, & Greist (2002).

The W&SAS is a five item self-report measure. It is used to assess the impact of an individual's mental health difficulties on their ability to function within a variety of domains; work, home management, social leisure activities, private leisure activities, and personal or family relationships

Psychiatric Diagnostic Screening Questionnaire (PDSQ); Zimmerman and Matthia (2001).

The PDSQ screens for the most common Diagnostic and Statistical Manual of Mental Disorders – 4th edition (DSM IV) Axis I disorders encountered in outpatient settings. It screens for; Major Depressive Disorder, Generalised Anxiety Disorder, Panic Disorder, Post-traumatic Stress Disorder, Alcohol Abuse/Dependence, Drug Abuse/Dependence, Psychosis, Bulimia/Binge-Eating Disorder, Somatisation Disorder, Obsessive-Compulsive Disorder, Social Phobia, Hypochondriasis and Agoraphobia.

IAPT phobia scales

These are used to identify patients scoring below the clinical cut-off points for the PHQ-9 and GAD-7 despite their lives being significantly impaired by an anxiety disorder. These phobia questions have not yet been validated as screening tools. However, the clinical cut-off point is considered to be a score of 4 or above, as this indicates that further assessment is needed to establish the impact of the phobia on the patient's functioning. The questions are based on the Marks & Matthews Fear questionnaire (Marks & Matthews, 1979) used to measure the severity of phobias, and are typical of the questions asked in many other similar fear questionnaires.